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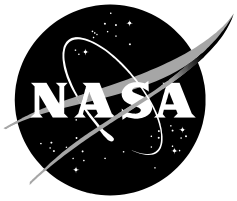

Tests of Full-Scale Helicopter Rotors at High Advancing Tip Mach Numbers and Advance Ratios

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May 2015

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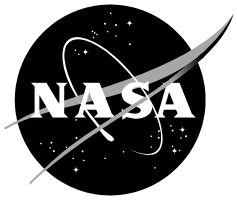

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INTRODUCTION

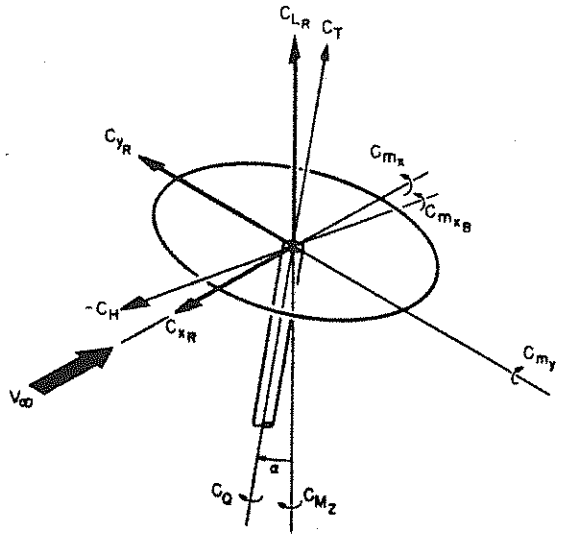
As a continuation of the studies of reference 1, three full-scale helicopter rotors have been tested in the Ames Research Center 40- by 80-foot wind tunnel. All three of them were two-bladed, teetering rotors.

One of the rotors incorporated the NACA 0012 airfoil section over the entire length of the blade. This rotor was tested at advance ratios up to 1.05. Both of the other rotors were tapered in thickness and incorporated leading-edge camber over the outer 20 percent of the blade radius. The larger of these rotors was tested at advancing tip Mach numbers up to 1.02.

Data were obtained for a wide range of lift and propulsive force, and are presented without discussion.

NOTATION

Positive direction of forces and moments are shown in the following sketch.



A_{1_s}, B_{1_s} — coefficients in the representation of rotor blade cyclic pitch, that is, $\theta_c = -A_{1_s} \cos\psi - B_{1_s} \sin\psi$, deg

a_{1_s}, b_{1_s} — first harmonic flapping coefficients relative to shaft normal plane, deg

ALPHA CONTROL	angle of attack of control axis (swash plate) relative to tunnel centerline; positive tilted aft, ALPHA CONTROL = ALPHA SHAFT $-B_{1_s}$, deg
ALPHA SHAFT	angle of rotor shaft from vertical, positive is shaft tilted aft, deg
$C_{D_{tare}}$	$\frac{(\text{Drag})_{tare}}{qS}$
$C_{L_{tare}}$	$\frac{(\text{Lift})_{tare}}{qS}$
CH	rotor propulsive force coefficient in shaft axes system, $\frac{C_H}{\sigma}$
CLR	rotor lift coefficient in wind axes system, $\frac{\text{LIFT}}{\rho S\ (\Omega R)^2}$
$C_{l_{tare}}$	$\frac{(\text{Rolling moment}_{tare})}{q \quad S \quad R}$
$C_{m_{tare}}$	$\frac{(\text{Pitching moment}_{tare})}{q \quad S \quad R}$
CMX	resultant rolling moment coefficient about rotor center in wind axes system, $\frac{\text{rolling moment}}{\rho S(\Omega R)^2 R}$, $\frac{C_{m_x}}{\sigma}$
CMXB	rolling moment coefficient about rotor center in shaft axes system
CMY	resultant pitching moment coefficient about rotor center, $\frac{\text{pitching moment}}{\rho S(\Omega R)^2 R}$, $\frac{C_{m_y}}{\sigma}$

CMZ	resultant yawing moment coefficient about rotor center in wind axes system, $\frac{\text{yawing moment}}{\rho S(\Omega R)^2 R}$, $\frac{C_{m_z}}{\sigma}$
$C_{n_{tare}}$	$\frac{(\text{Yawing moment}_{tare})}{q \quad S \quad R}$
CP	rotor power coefficient, $\frac{\text{power}}{\rho S(\Omega R)^3}$
CPO	profile power coefficient, $CPO = CP - (CLR)^2 \frac{\sigma}{2(V/OR)} - CXR\ (V/OR)$
CQ	rotor torque coefficient (shaft axes yawing moment coefficient)
CT	rotor thrust coefficient (shaft axes lift coefficient)
CXR	rotor propulsive force coefficient in wind axes system, $-\frac{\text{Drag}}{\rho S(\Omega R)^2}$
$C_{y_{tare}}$	$\frac{(\text{Side force}_{tare})}{qS}$
CYR	rotor side force coefficient, $\frac{\text{side force}}{\rho\ S\ (\Omega R)^2}$, $\frac{C_{Y_R}}{\sigma}$ (same in both wind axes and shaft axes systems)
M(1)(90), M,AT	rotor blade tip Mach no. at 90^o azimuth position
q	free stream dynamic pressure, $1/2\ \rho V^2$, lb/ft^2
R	rotor radius, ft
S	reference area, (no. of blades)x(blade chord)x(rotor radius)ft^2

T	free stream temperature, deg R
THETA	collective pitch at .75R, deg*
V	free stream velocity, ft/sec
V/OR	advance ratio, $V/\Omega R$
ρ	air density, $slug/ft^3$
Ω	rotor rotational speed, radians/sec
σ	rotor solidity, $\frac{S}{\pi R^2}$
Θ_c	cyclic pitch, deg*
Θ_1	blade twist,deg*, from center of shaft to blade tip
Θ_{grip}	collective pitch at 2.33 ft radial distance from hub center, deg

*Pitch angles are measured from a plane perpendicular to the rotor shaft to the line of zero lift of the airfoil section.

MODEL DESCRIPTION

General

Figure 1 is a general view of the rotor system installed in the wind tunnel test section. Rotor shaft angle-of-attack was remotely controlled using an extendable tail strut. Rotor power was provided by a 1500 HP variable frequency electric motor inside the faired body. Collective and cyclic pitch were remotely controlled and monitored from the control

room. First harmonic rotor flapping coefficients relative to the shaft were obtained from electronic flapping resolvers.

Rotors

Three sets of blades were used for these investigations. The 34 ft blades had NACA 0012 airfoil sections. The 44 ft and the 48 ft blades were tapered linearly in thickness from .8R to the tip, which was approximately the NACA 21006 airfoil. The tip airfoil is described in detail in figure 2. The dimensional information related to the rotors is given below.

Parameter	Rotor No. 1	No. 2	No. 3
Rotor radius, ft	24.0	22.0	17.0
Blade chord, ft	1.75	1.75	1.75
Cutout radius, ft	2.04	2.04	2.04
Rotor solidity	.0464	.0506	.0656
Reference area, ft^2	84.0	77.0	59.5
Blade twist, linear, deg	-10.9	-1.83	-1.42
Blade taper ratio	1.0	1.0	1.0
Hub precone angle, deg	2.75	2.75	2.75
Moment of inertia about flapping hinge, ft-lb-sec^2, per rotor	2289	1995.2	1361.6
Number of blades	2	2	2
Airfoil	NACA 0012*	NACA 0012*	NACA 0012

A standard UH-1D transmission and rotor shaft were used in conjunction with a speed increasing transmission to match the motor speed

to the UH-1D transmission. The rotor was controlled by a modified UH-1B control system.

*These thin tip blades were NACA 0012 from the root to .8R, and linearly tapered in thickness from .8R to the 6% thick tip. The zero lift line of the cambered tip sections was varied such that the linear twist distribution was maintained. (See figure 2.)

OPERATING PROCEDURES

Tunnel speed and rotor rotational speed were adjusted to obtain the desired advance ratio and advancing tip Mach number. At each combination of shaft angle and collective pitch, the cyclic pitch was adjusted to minimize first harmonic blade flapping, and data were then recorded. Collective pitch or shaft angle was then changed and the above procedure repeated until a limit was reached in motor power, control position, or structural loading.

Data Reduction

Six-component forces and moments were measured by the wind tunnel balance system. Tare corrections were applied to the balance data to account for forces and moments produced by the exposed model support struts, the faired body and the rotating hub. All rotating hardware inboard of the 2.66 ft radius station were included in the tares. The tares were applied based on wind tunnel dynamic pressure and shaft angle.

Rotor downwash effects on the tares were neglected because of a lack of confidence in any known technique for assessing their magnitude. The tares used are listed below in equation form.

For Rotor No. 1:

$$C_{L_{tare}} = -0.8898 + 1.0521 \cos \alpha_s + 0.3913 \sin \alpha_s$$

$$C_{D_{tare}} = 0.9456 - 0.7869 \cos \alpha_s + 0.1288 \sin \alpha_s$$

$$C_{m_{tare}} = 0.4623 - 0.4933 \cos \alpha_s + 0.1732 \sin \alpha_s$$

$$C_{y_{tare}} = 0.0178 - 0.0215 \cos \alpha_s + 0.0257 \sin \alpha_s$$

$$C_{n_{tare}} = 0.$$

$$C_{l_{tare}} = 0.00246 - 0.000446 \cos \alpha_s - 0.01813 \sin \alpha_s$$

For Rotors No. 2 & 3:

$$C_{L_{tare}} = \frac{1}{s}(-29.740 + 39.39 \cos \alpha_s + 29.33 \sin \alpha_s + .0311q + 240.54 \alpha_{s_{radians}}^{3} - 90.96 \alpha_{s_{radians}}^{4} - 1046.3 \alpha_{s_{radians}}^{5} + 193.68 \alpha_{s_{radians}}^{6})$$

$$C_{D_{tare}} = \frac{1}{s}(59.895 - 49.767 \cos \alpha_s + 6.456 \sin \alpha_s + .0466q + 38.975 \alpha_{s_{radians}}^{3} + 336.69 \alpha_{s_{radians}}^{4} + 102.92 \alpha_{s_{radians}}^{5} - 754.89 \alpha_{s_{radians}}^{6})$$

$$C_{m_{tare}} = \frac{1}{s}(-419.97 + 470.78 \cos \alpha_s + 292.20 \sin \alpha_s - 2.312q - 2072.3 \alpha_{s_{radians}}^{3} + 4381.0 \alpha_{s_{radians}}^{4} + 10514.9 \alpha_{s_{radians}}^{5} - 9448.1 \alpha_{s_{radians}}^{6})$$

$$C_{y_{tare}} = \frac{1}{s}(2.989 - 3.983 \cos \alpha_s - 2.191 \sin \alpha_s + .009q + 126.06 \alpha_{s_{radians}}^{3} + 160.65 \alpha_{s_{radians}}^{4} - 1301.7 \alpha_{s_{radians}}^{5} - 2634.1 \alpha_{s_{radians}}^{6})$$

$$C_{n_{tare}} = \frac{1}{s}(-72.312 + 79.817 \cos \alpha_s + 15.230 \sin \alpha_s - .1695q - 642.46 \alpha_{s_{radians}}^{3} - 1237.31 \alpha_{s_{radians}}^{4} + 1215.98 \alpha_{s_{radians}}^{5} + 4080.31 \alpha_{s_{radians}}^{6})$$

$$C_{l_{tare}} = \frac{1}{s}((-27.709 + 41.964 \cos \alpha_s - 4.227 \sin \alpha_s - .210q - 351.91 \alpha_{s_{radians}}^{3} - 812.0 \alpha_{s_{radians}}^{4} + 637.27 \alpha_{s_{radians}}^{5} + 1063.68 \alpha_{s_{radians}}^{6})$$

The control axis angle of attack (ALPHA CONTROL) was determined by the equation

$$\text{ALPHA CONTROL} = \text{ALPHA SHAFT} - B_{l_S}$$

where longitudinal cyclic, B_{1_S}, was obtained from model instrumentation. The total torque coefficient, $\frac{C_Q}{\sigma}$, was derived from tunnel balance moment data. The term $\frac{C_{P_o}}{\sigma}$ was computed by the equation

$$CPO = CP - \frac{\sigma(CLR)^2}{2(V/OR)} - CXR(V/OR)$$

This equation is based on the assumption of uniform downwash distribution over the rotor disk.

Tabulated data are presented in both the wind and shaft axes systems. All data are referenced to the rotor hub center.

Data Presentation

Test conditions for the rotors are illustrated on the Rotor Velocity Diagrams shown in Figure 3. Numbers adjacent to the symbols on these diagrams refer to table numbers which present the data for that condition.

Tabulated data are presented in both the wind axes and shaft axes systems.

Although the technique used in these tests was directed toward obtaining data with $a_{1_s} = b_{1_s} = 0$, some data were recorded wherein flapping was not zero. Of those data, only those for which $|a_{1_s}|$ or $|b_{1_s}|$ was greater than .2° are so noted and listed in the tabulated data.

References

1. McCloud, John L. III, Biggers, James C., and Stroub, Robert H.: An Investigation of Full-Scale Helicopter Rotors at High Advance Ratios and Advancing Tip Mach Numbers. NASA TN D-4632, July, 1968.

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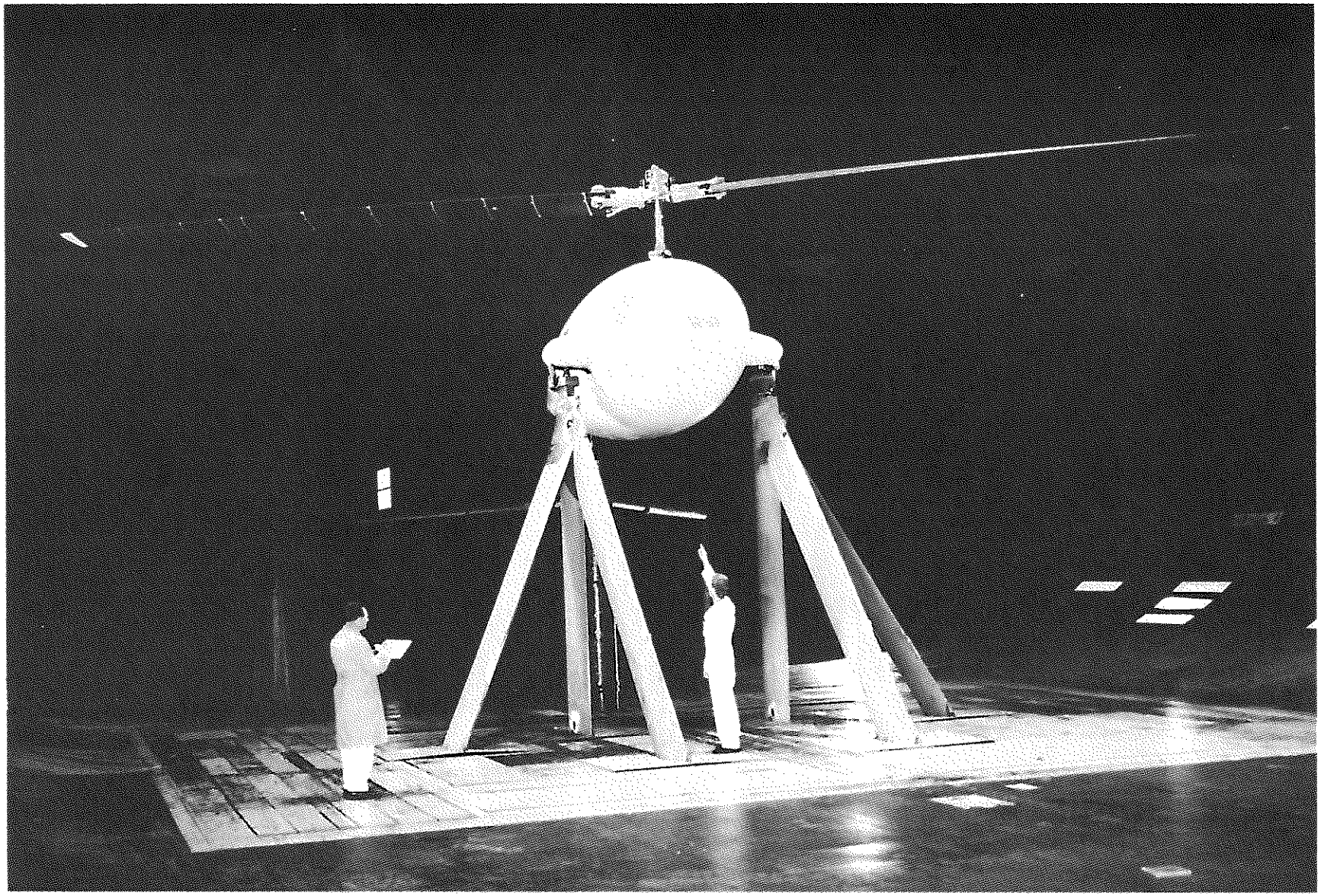
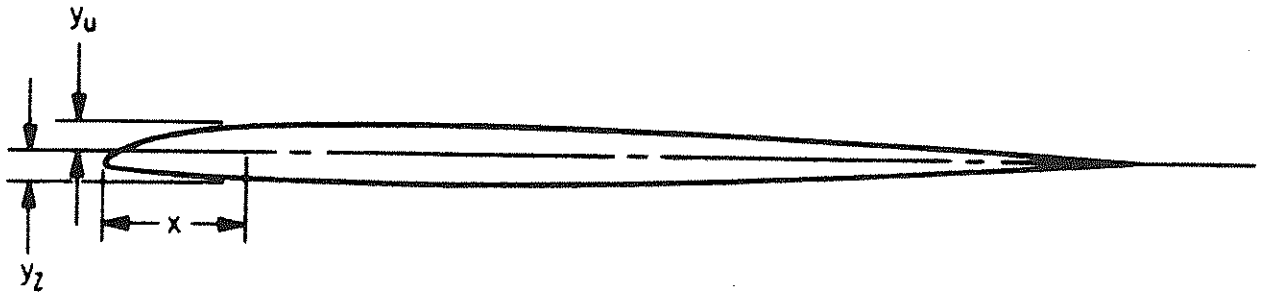


Figure 1.- GENERAL VIEW OF ROTOR SYSTEM.

Figure 2.- UPPER AND LOWER SURFACE COORDINATES OF BLADE TIP AIRFOIL SECTION FOR ROTORS NO. 1 AND 2

All dimensions are in inches



x	y_{upper}	y_{lower}
0	-0.25	-0.25
.105	-.082	-.343
.210	-.002	-.373
.420	.110	-.398
.630	.193	-.417
.840	.260	-.435
1.050	.318	-.451
1.575	.415	-.490
2.100	.485	-.520
2.625	.532	-.545
3.150	.562	-.562
4.200	.603	-.603
5.250	.623	-.623
6.300	.630	-.630
7.350	.625	-.625
8.400	.609	-.609
10.500	.556	-.556
12.600	.479	-.479
14.700	.385	-.385
18.900	.152	-.152
19.950	.085	-.085
21.000	.020	-.020

Leading-edge radius = 0.062 at y = -0.250.

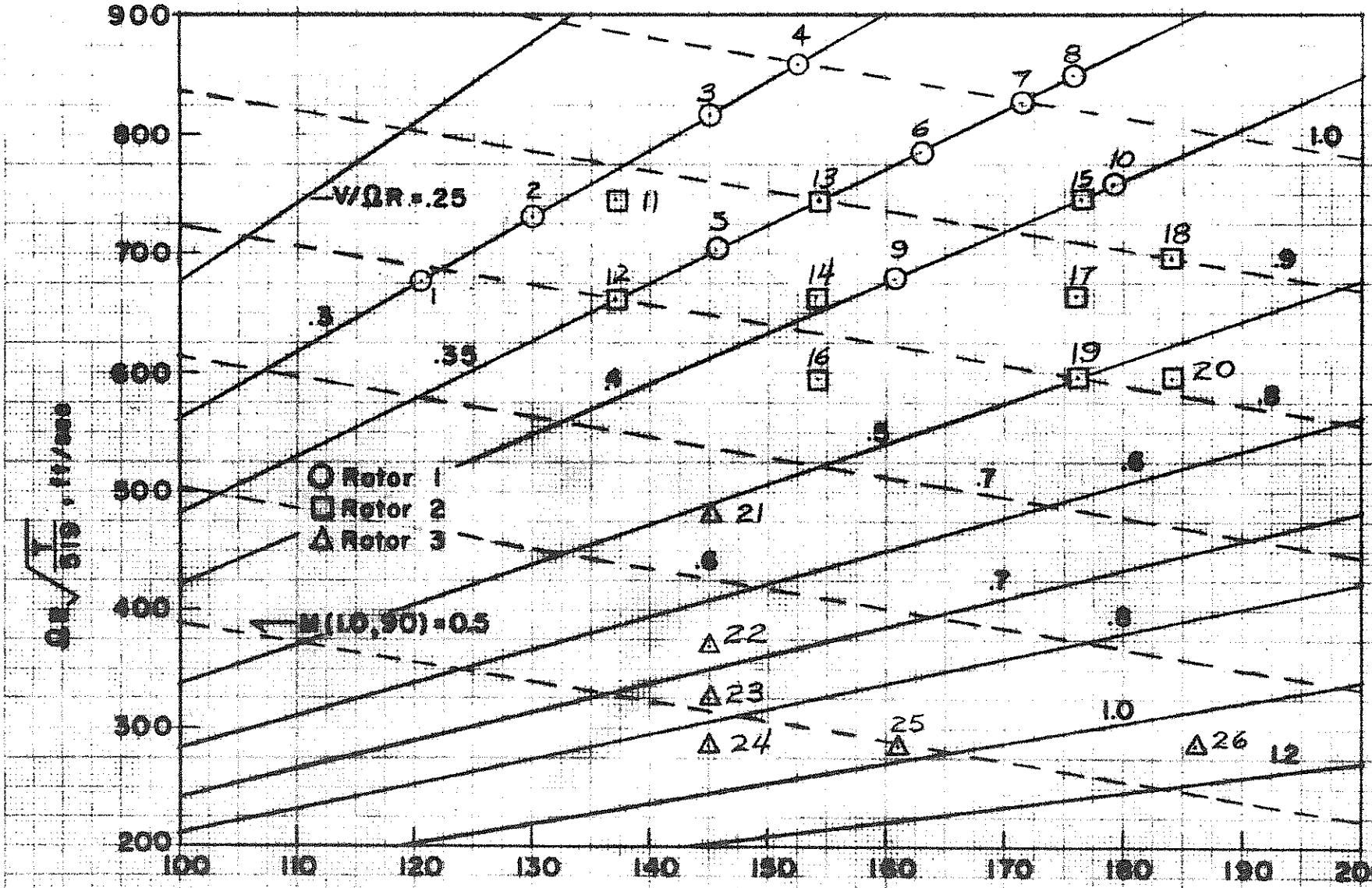


Figure 3. Rotor velocity diagram

Table I - 1. Rotor No. 1, V/OR = .30, M(1.0, 90) = .79

TEST 288.0 RUN 7

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_S}	θ_{gnp}
14.	-5.0	-8.4	0.051042	0.002568	-0.001276	0.000074	-0.001055	0.002799	0.0026220	0.0016538	0.298	0.790	.6	14.
15.	-5.0	-10.0	0.069612	0.004637	-0.001616	-0.000009	-0.001229	0.003850	0.0035134	0.0017465	0.300	0.788	.2	16.
16.	-5.0	-11.7	0.083975	0.006965	-0.002005	-0.000068	0.000475	0.005119	0.0048717	0.0022472	0.298	0.790	- .1	18.
17.	-10.0	-14.1	0.041437	0.005676	-0.000734	-0.000403	-0.001072	0.003689	0.0034549	0.0016240	0.299	0.787	.8	16.
18.	-10.0	-15.4	0.060330	0.009626	-0.000829	-0.000664	-0.001308	0.005212	0.0049584	0.0017851	0.300	0.786	.6	18.
19.	-10.0	-12.5	0.024051	0.002354	-0.000851	-0.000148	-0.000851	0.002502	0.0022614	0.0015147	0.298	0.786	.8	14.
20.	-10.0	-11.0	0.005556	-0.000825	-0.000783	-0.000087	-0.000559	0.001460	0.0012243	0.0014666	0.297	0.789	.8	12.
21.	-15.0	-18.2	0.017512	0.002733	-0.000712	-0.000497	-0.000837	0.002596	0.0023464	0.0015057	0.299	0.788	.7	16.
22.	-15.0	-19.3	0.034167	0.007581	-0.000511	-0.000848	-0.001018	0.004228	0.0040008	0.0016396	0.300	0.788	.9	18.
23.	-15.0	-20.9	0.050058	0.012464	-0.000577	-0.001292	-0.001320	0.005888	0.0056643	0.0017362	0.300	0.786	.6	20.
24.	-5.0	-6.9	0.030671	0.000862	-0.000943	0.000094	-0.000838	0.002030	0.0018685	0.0015376	0.299	0.788	.7	12.
25.	-5.0	-5.6	0.012428	-0.000611	-0.000849	0.000075	-0.000655	0.001498	0.0013534	0.0015223	0.296	0.790	.8	10.
26.	0.0	-1.5	0.040323	-0.001729	-0.001402	0.000250	-0.000789	0.001265	0.0011344	0.0015245	0.299	0.788	.8	10.
27.	0.0	-2.8	0.059234	-0.001814	-0.001919	0.000384	-0.001146	0.001558	0.0013702	0.0016352	0.297	0.791	.7	12.
28.	0.0	-4.5	0.078254	-0.001343	-0.002413	0.000440	-0.001197	0.002139	0.0019386	0.0018645	0.299	0.789	0.0	14.
29.	0.0	-6.4	0.094102	-0.000070	-0.002997	0.000428	-0.001402	0.003168	0.0029558	0.0022886	0.299	0.789	- .3	16.
30.	0.0	-0.3	0.019694	-0.001579	-0.001315	0.000192	-0.000589	0.001205	0.0010828	0.0015209	0.297	0.792	.7	8.
31.	4.0	3.4	0.042841	-0.004535	-0.002352	0.000482	-0.000721	0.000380	0.0003431	0.0015473	0.297	0.791	.2	8.
32.	4.0	1.8	0.061487	-0.005792	-0.002753	0.000535	-0.000950	0.000286	0.0002490	0.0016790	0.298	0.789	.1	10.
33.	4.0	0.2	0.080812	-0.006906	-0.003299	0.000555	-0.001244	0.000494	0.0004407	0.0019920	0.298	0.789	- .2	12.
34.	4.0	-1.6	0.096365	-0.006799	-0.003751	0.000715	-0.001163	0.001163	0.0010647	[illegible]855	0.300	0.786	- .5	14.

Table I - 2. Rotor No. 1, V/OR = .30, M(1.0, 90) = .85

TEST 288.0 RUN 3

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.3	0.029615	0.001078	-0.001282	0.000380	-0.000334	0.002062	0.0019000	0.0015069	0.302	0.848	1.0	12.
2.	-5.0	-8.7	0.048920	0.002887	-0.001518	0.000359	-0.000430	0.002843	0.0026723	0.0016161	0.302	0.848	.7	14.
3.	-5.0	-10.3	0.067184	0.005046	-0.001743	0.000265	-0.000415	0.003836	0.0036739	0.0018091	0.301	0.852	.6	16.
4.	-5.0	-12.0	0.084405	0.007658	-0.001996	0.000063	-0.000319	0.005237	0.0050028	0.0021308	0.304	0.844	.3	18.
5.	-7.0	-13.6	0.073726	0.008862	-0.001443	-0.000263	-0.000327	0.005302	0.0050733	0.0019787	0.302	0.848	.5	18.
6.	-12.0	-17.2	0.048236	0.009409	-0.000319	-0.000807	-0.000379	0.004811	0.0046283	0.0016049	0.302	0.848	1.0	18.
7.	-10.0	-15.6	0.057903	0.009732	-0.000621	-0.000571	-0.000347	0.005053	0.0049216	0.0017150	0.303	0.846	.8	18.
8.	-10.0	-16.6	0.066472	0.011672	-0.000599	-0.000731	-0.000328	0.005890	0.0056886	0.0018204	0.302	0.848	.8	19.
9.	-8.0	-15.0	0.074956	0.011075	-0.000899	-0.000574	-0.000233	0.005943	0.0057666	0.0019840	0.303	0.847	.6	19.
10.	-6.0	-13.5	0.085678	0.009954	-0.001652	-0.000285	-0.000276	0.005923	0.0057435	0.0021661	0.303	0.846	.3	19.
11.	-7.0	-14.4	0.081135	0.010534	-0.001227	-0.000488	-0.000404	0.005948	0.0057604	0.0020651	0.303	0.846	.5	19.
12.	-7.0	-10.1	0.037511	0.003332	-0.000888	0.000059	-0.000419	0.002708	0.0025894	0.0014714	0.303	0.846	.9	14.
13.	-7.0	-8.5	0.019135	0.000972	-0.000895	0.000170	-0.000288	0.001883	0.0017432	0.0014205	0.303	0.846	1.1	12.
14.	-7.0	-7.2	0.001754	-0.001026	-0.000771	0.000057	-0.000508	0.001245	0.0010493	0.0013602	0.303	0.846	.9	10.
15.	-7.0	-7.2	0.002315	-0.001203	-0.000864	0.000176	-0.000566	0.001261	0.0010714	0.0014367	0.304	0.844	1.0	10.
16.	-3.0	-2.8	0.003543	-0.000988	-0.001381	0.000329	-0.000468	0.001328	0.0012148	0.0015131	0.303	0.847	1.0	8.
17.	-3.0	-1.4	-0.015453	-0.001743	-0.001444	0.000309	-0.000434	0.001247	0.0010429	0.0015516	0.302	0.848	.8	6.
18.	-3.0	-8.8	0.077304	0.003725	-0.002054	0.000280	-0.000355	0.003690	0.0034991	0.0019128	0.303	0.846	.5	16.
19.	-3.0	-10.6	0.092614	0.005961	-0.002367	0.000178	-0.000330	0.005048	0.0048308	0.0023621	0.305	0.843	.1	18.
20.	0.0	-6.5	0.091997	0.000460	-0.003254	0.000647	-0.000524	0.003244	0.0030821	0.0022953	0.303	0.846	.1	16.
21.	0.0	-7.7	0.096586	0.001739	-0.003494	0.000568	-0.000490	0.004078	0.0038343	0.0025935	0.304	0.845	- .2	17.
22.	0.0	-2.9	0.056426	-0.001257	-0.002227	0.000668	-0.000322	0.001600	0.0014321	0.0015721	0.304	0.843	.8	12.
23.	3.0	-0.7	0.073508	-0.004801	-0.003199	0.000902	-0.000413	0.000870	0.0007465	0.0017912	0.304	0.845	.3	12.
24.	3.0	0.8	0.053559	-0.004026	-0.002717	0.000829	-0.000404	0.000695	0.0006247	0.0016243	0.303	0.847	.7	10.
25.	3.0	2.2	0.034665	-0.003034	-0.002469	0.000807	-0.000321	0.000770	0.0006969	0.0015270	0.304	0.844	.8	8.
26.	3.0	3.6	0.016667	-0.001996	-0.002354	0.000791	-0.000312	0.001041	0.0009736	0.0015603	0.305	0.843	.8	6.
27.	3.0	-2.4	0.089094	-0.004410	-0.003860	0.000977	-0.000439	0.001500	0.0013870	0.0021163	0.303	0.846	- .1	14.
28.	3.0	-4.5	0.099900	-0.002802	-0.004146	0.000897	-0.000413	0.003114	0.0029625	0.0030441	0.302	0.848	- .2	15.

Table I - 3. Rotor No. 1, V/OR = .30, M(1.0, 90) = .95

TEST 288.0 RUN 8

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.8	0.049643	0.002083	-0.001365	0.000120	-0.000400	0.003044	0.0028280	0.0020170	0.297	0.952	.5	14.
2.	-5.0	-6.5	0.031727	0.000432	-0.001188	0.000260	-0.000411	0.002413	0.0021827	0.0019755	0.300	0.953	.7	12.
3.	-5.0	-9.2	0.067771	0.003868	-0.001843	0.000083	-0.000422	0.004109	0.0038730	0.0023585	0.300	0.953	.3	16.
4.	-5.0	-10.2	0.075513	0.005012	-0.002260	0.000101	-0.000431	0.004774	0.0045508	0.0026049	0.300	0.951	.1	17.
5.	-5.0	-10.8	0.083909	0.006477	-0.002516	0.000161	-0.000503	0.005633	0.0053803	0.0028925	0.300	0.950	0.0	18.
6.	-10.0	-13.3	0.040517	0.004937	-0.000655	-0.000317	-0.000534	0.003784	0.0034776	0.0018744	0.299	0.952	.9	16.
7.	-10.0	-14.8	0.056865	0.008451	-0.000808	-0.000598	-0.000608	0.005304	0.0050772	0.0022950	0.300	0.952	.6	18.
8.	-10.0	-14.1	0.049363	0.006779	-0.000641	-0.000469	-0.000533	0.004574	0.0043715	0.0021451	0.301	0.948	.8	17.
9.	-15.0	-17.6	0.017051	0.002301	-0.000505	-0.000399	-0.000407	0.002769	0.0025684	0.0018567	0.299	0.948	1.1	16.
10.	-15.0	-18.8	0.033473	0.006913	-0.000349	-0.000868	-0.000436	0.004328	0.0041427	0.0019783	0.301	0.948	1.0	18.
11.	-15.0	-19.4	0.041103	0.009203	-0.000262	-0.001092	-0.000455	0.005129	0.0048732	0.0019820	0.300	0.951	1.0	19.
12.	-17.0	-20.5	0.022761	0.004843	-0.000102	-0.000825	-0.000250	0.003521	0.0034500	0.0019624	0.299	0.950	1.2	18.
13.	-17.0	-21.1	0.028974	0.006998	0.000119	-0.001116	-0.000374	0.004181	0.0041537	0.0019900	0.300	0.950	1.1	19.
14.	-17.0	-21.5	0.037228	0.009667	0.000123	-0.001422	-0.000489	0.005098	0.0050920	0.0020825	0.300	0.950	1.0	20.
15.	-17.0	-20.0	0.015199	0.002473	-0.000301	-0.000637	-0.000268	0.002751	0.0026388	0.0018826	0.298	0.949	1.2	17.
16.	-17.0	-19.3	0.007663	0.000048	-0.000529	-0.000230	-0.000280	0.002109	0.0019419	0.0019230	0.298	0.948	1.1	16.

TEST 288.0 RUN 9

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-3.0	-4.1	0.029093	-0.001945	-0.001531	0.000369	0.000361	0.002054	0.0018774	0.0023919	0.298	0.955	.8	11.
2.	-3.0	-3.5	0.024576	-0.000904	-0.001385	0.000323	-0.000543	0.001823	0.0016829	0.0019072	0.300	0.950	.7	10.
3.	-3.0	-6.9	0.070846	0.001570	-0.002267	0.000372	-0.000610	0.003386	0.0031878	0.0023283	0.301	0.949	.3	15.
4.	-3.0	-7.7	0.077569	0.002401	-0.002366	0.000302	-0.000713	0.003975	0.0037550	0.0025696	0.300	0.951	.2	16.
5.	-3.0	-8.5	0.085398	0.003338	-0.002623	0.000400	-0.000952	0.004721	0.0045009	0.0029370	0.299	0.953	.2	17.
6.	-3.0	-9.2	0.090634	0.004667	-0.003090	0.000306	-0.000660	0.005621	0.0053979	0.0033668	0.298	0.955	-.1	18.
7.	-5.0	-9.8	0.077246	0.004883	-0.002283	0.000084	-0.000789	0.004824	0.0045965	0.0026670	0.301	0.952	.1	17.
8.	-5.0	-10.5	0.085093	0.006108	-0.002491	-0.000161	-0.000731	0.005638	0.0053857	0.0029917	0.300	0.953	0.0	18.
9.	2.0	1.0	0.051233	-0.004198	-0.002344	0.000578	-0.000531	0.001124	0.0010242	0.0020710	0.298	0.950	.5	10.
10.	2.0	1.5	0.043925	-0.004130	-0.002307	0.000631	-0.000526	0.001064	0.0009865	0.0020823	0.301	0.951	.6	9.
11.	0.0	-4.3	0.086392	-0.001878	-0.003119	0.000563	-0.000286	0.003007	0.0028442	0.0028381	0.302	0.951	.1	15.
12.	0.0	-5.2	0.091684	-0.000793	-0.003345	0.000715	-0.000118	0.003839	0.0036533	0.0032455	0.301	0.954	0.0	16.
13.	0.0	-5.9	0.097128	-0.000299	-0.003257	0.000532	-0.000233	0.004874	0.0046408	0.0040022	0.300	0.953	-.2	17.
14.	5.0	4.1	0.060445	-0.008006	-0.003105	0.000746	-0.000933	0.000158	0.0001551	0.0022705	0.300	0.947	.3	9.
15.	5.0	3.4	0.070897	-0.008840	-0.003332	0.000794	-0.000441	0.000233	0.0002345	0.0024855	0.299	0.950	.3	10.
16.	5.0	1.7	0.085032	-0.009209	-0.003742	0.000950	-0.000579	0.000730	0.0007587	0.0029783	0.301	0.951	.1	12.

Table I - 4. Rotor No. 1, V/OR = .31, M(1.0, 90) = 1.0

TEST 288.0 RUN 11

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	θ_{grip}	A_{1_s}
1.	-5.0	-6.1	0.032471	-0.000348	-0.001252	0.000168	-0.000477	0.002870	0.0027214	0.0027498	0.309	0.990	12.	.9
2.	-6.0	-6.9	0.026653	-0.000282	-0.001064	0.000165	-0.000500	0.002857	0.0026933	0.0027274	0.309	0.989	12.	.9
3.	-6.0	-7.2	0.035456	0.000491	-0.001079	0.000057	-0.000547	0.003216	0.0030847	0.0028387	0.308	0.992	13.	.7
4.	-6.0	-7.9	0.045178	0.001292	-0.001303	0.000067	-0.000820	0.003626	0.0034651	0.0029119	0.310	0.989	14.	.6
5.	-6.0	-8.6	0.053029	0.002146	-0.001232	-0.000075	-0.000894	0.004182	0.0039924	0.0031173	0.310	0.991	15.	.6
6.	-6.0	-9.5	0.060671	0.003230	-0.001512	-0.000079	-0.000802	0.004711	0.0044980	0.0032202	0.310	0.989	16.	.5
7.	-9.0	-10.6	0.029126	0.001277	-0.000692	-0.000161	-0.000669	0.003415	0.0032531	0.0027946	0.309	0.990	14.	.9
8.	-9.0	-11.2	0.037116	0.002580	-0.000648	-0.000282	-0.000707	0.003940	0.0037705	0.0028688	0.310	0.990	15.	.9
9.	-9.0	-11.8	0.046723	0.003991	-0.000773	-0.000374	-0.000844	0.004601	0.0044456	0.0030483	0.309	0.992	16.	.8
10.	-9.0	-12.5	0.055362	0.005366	-0.000870	-0.000416	-0.001114	0.005302	0.0050958	0.0032046	0.310	0.991	17.	.7
11.	-12.0	-13.8	0.022260	0.001529	-0.000591	-0.000376	-0.000627	0.003402	0.0032316	0.0027240	0.308	0.992	15.	1.0
12.	-12.0	-14.3	0.030262	0.003301	-0.000534	-0.000493	-0.000696	0.003974	0.0038187	0.0027296	0.309	0.990	16.	1.0
13.	-12.0	-15.0	0.039006	0.005051	-0.000547	-0.000672	-0.000811	0.004819	0.0045337	0.0028584	0.309	0.993	17.	.9
14.	-12.0	-13.2	0.013491	-0.000154	-0.000576	-0.000282	-0.000418	0.002845	0.0026525	0.0026861	0.308	0.990	14.	1.1
15.	-9.0	-9.9	0.020624	0.000150	-0.000567	-0.000169	-0.000632	0.002926	0.0028093	0.0027311	0.307	0.991	13.	1.1
16.	-3.0	-6.7	0.052676	-0.000639	-0.001710	0.000281	-0.000713	0.003062	0.0029527	0.0029403	0.308	0.991	13.	.6
17.	-3.0	-4.7	0.054202	-0.000924	-0.001690	0.000312	-0.000808	0.003355	0.0032226	0.0032787	0.304	1.002	13.	.6
18.	-6.0	-7.2	0.038219	0.000291	-0.000987	0.000024	-0.000698	0.003461	0.0033327	0.0031327	0.304	1.002	13.	.7
19.	-6.0	-7.7	0.046604	0.001107	-0.001026	-0.000067	-0.000767	0.003866	0.0037212	0.0032181	0.305	1.000	14.	.6
20.	-6.0	-8.5	0.054744	0.001993	-0.001240	-0.000066	-0.000832	0.004425	0.0042687	0.0034332	0.305	1.002	15.	.3
21.	-6.0	-9.2	0.062730	0.003023	-0.001423	0.000065	-0.000491	0.004965	0.0046917	0.0034693	0.305	1.000	16.	.2
22.	-9.0	-11.8	0.047482	0.003988	-0.000623	-0.000445	-0.000664	0.004803	0.0046979	0.0033135	0.304	1.002	16.	.6
23.	-9.0	-11.1	0.039178	0.002597	-0.000481	-0.000368	-0.000699	0.004174	0.0040509	0.0031449	0.304	1.002	15.	.9
24.	-9.0	-10.4	0.029298	0.001196	-0.000414	-0.000316	-0.000542	0.003519	0.0034077	0.0029777	0.305	0.999	14.	.9
25.	-9.0	-9.8	0.022933	0.000131	-0.000338	-0.000301	-0.000567	0.003134	0.0030505	0.0029707	0.304	1.000	13.	.9
26.	-6.0	-7.1	0.038329	0.000282	-0.000872	-0.000048	-0.000687	0.003516	0.0033902	0.0031924	0.303	1.004	13.	.7

Table I - 5. Rotor No. 1, V/OR = .35, M(1.0, 90) = .85

TEST 288.0 RUN 4

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.6	0.023610	0.000516	-0.000707	0.000124	-0.000444	0.001898	0.0018362	0.0016202	0.347	0.849	.7	12.
2.	-5.0	-6.1	0.007668	-0.000897	-0.000589	0.000122	-0.000394	0.001369	0.0013124	0.0016195	0.346	0.849	1.1	10.
3.	-5.0	-11.0	0.056771	0.004128	-0.000982	0.000024	-0.000586	0.003675	0.0035842	0.0019385	0.346	0.848	.9	16.
4.	-5.0	-13.0	0.071727	0.006495	-0.001353	-0.000147	-0.000661	0.004958	0.0048405	0.0022280	0.350	0.844	.5	18.
5.	-5.0	-14.5	0.082621	0.008897	-0.001686	-0.000320	-0.000170	0.006433	0.0062898	0.0027458	0.347	0.848	.3	20.
6.	-10.0	-14.7	0.030283	0.003654	-0.000058	-0.000373	-0.000540	0.003073	0.0029696	0.0016416	0.347	0.849	1.1	16.
7.	-10.0	-16.2	0.045940	0.007054	0.000137	-0.000611	-0.000737	0.004490	0.0044772	0.0018932	0.346	0.851	1.0	18.
8.	-10.0	-17.8	0.060293	0.010363	-0.000107	-0.000924	-0.000751	0.006030	0.0059742	0.0021438	0.346	0.850	.8	20.
9.	-12.0	-16.2	0.020177	0.002349	0.000071	-0.000388	-0.000468	0.002571	0.0025652	0.0017222	0.347	0.848	1.1	16.
10.	-12.0	-17.7	0.035338	0.006238	0.000111	-0.000730	-0.000591	0.004027	0.0040242	0.0017763	0.347	0.848	1.1	18.
11.	-12.0	-19.2	0.048421	0.009760	-0.000172	-0.000991	-0.000652	0.005553	0.0055407	0.0020063	0.346	0.850	.9	20.
12.	-15.0	-19.9	0.020873	0.003682	0.000031	-0.000651	-0.000376	0.003124	0.0031337	0.0018318	0.346	0.850	1.1	18.
13.	-15.0	-21.4	0.033549	0.007583	-0.000072	-0.000957	-0.000471	0.004705	0.0046752	0.0019655	0.347	0.846	1.0	20.
14.	-15.0	-18.4	0.005736	-0.000667	-0.000049	-0.000327	-0.000236	0.001562	0.0015097	0.0017384	0.346	0.849	1.1	16.
15.	-12.0	-14.5	0.003187	-0.001340	0.000293	-0.000230	-0.000552	0.001207	0.0011524	0.0016164	0.347	0.849	1.2	14.
16.	0.0	-5.4	0.067680	-0.000392	-0.002576	0.000702	-0.000641	0.002186	0.0021002	0.0019293	0.346	0.850	.6	14.
17.	0.0	-7.5	0.082532	0.000561	-0.003145	0.000557	-0.000761	0.003168	0.0028951	0.0022445	0.346	0.849	.2	16.
18.	0.0	-9.5	0.091155	0.002701	-0.003595	0.000576	-0.000125	0.004880	0.0046932	0.0032014	0.346	0.849	.1	18.
19.	0.0	-3.9	0.050050	-0.000953	-0.002197	0.000643	-0.000781	0.001630	0.0015132	0.0016755	0.346	0.848	.7	12.
20.	2.0	-2.1	0.061886	-0.002824	-0.003126	0.000876	-0.000813	0.001216	0.0011312	0.0018499	0.346	0.849	.5	12.
21.	2.0	-3.0	0.068944	-0.002808	-0.003491	0.000829	-0.000844	0.001396	0.0013174	0.0019719	0.346	0.847	.3	14.
22.	2.0	-6.1	0.089849	-0.001365	-0.004242	0.000854	-0.000225	0.003067	0.0029179	0.0028476	0.346	0.850	0.0	16.
23.	2.0	-0.8	0.044836	-0.002526	-0.002663	0.000712	-0.000696	0.001040	0.0009221	0.0016651	0.347	0.847	.7	10.
24.	-5.0	-7.8	**********	**********	233.518621	**********	**********	-26.993653	0.0000000	**********	277.075	0.219		

Table I - 6. Rotor No. 1, V/OR = .35, M(1.0, 90) = .95

TEST 288.0 RUN 10

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-10.0	-10.3	-0.000000	-0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0011350	0.0011350	0.000	0.713	.5	6.
2.	-10.0	-10.3	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0010218	0.0010218	0.000	0.714	.5	8.
3.	-10.0	-10.3	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0011444	0.0011444	0.000	0.714	.5	10.
4.	-10.0	-10.2	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0017257	0.0017257	0.000	0.715	.3	12.
5.	-10.0	-10.3	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0025385	0.0025385	0.000	0.717	0.0	14.
6.	-10.0	-10.4	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0038112	0.0038112	0.000	0.716	0.0	16.
7.	-12.0	-15.2	0.023934	0.001967	-0.000972	-0.000167	-0.000568	0.003405	0.0030851	0.0023583	0.350	0.948	1.2	16.
8.	-12.0	-16.5	0.040197	0.005603	-0.000893	-0.000541	-0.000704	0.004901	0.0045926	0.0025190	0.351	0.948	1.1	18.
9.	-12.0	-17.2	0.046198	0.007090	-0.000688	-0.000660	-0.000766	0.005523	0.0052292	0.0025921	0.352	0.946	1.2	19.
10.	-15.0	-17.5	0.008784	-0.000722	-0.001054	-0.000109	-0.000384	0.002349	0.0020440	0.0022918	0.350	0.948	1.4	16.
11.	-15.0	-19.1	0.024610	0.003490	-0.001042	-0.000554	-0.000562	0.004067	0.0036510	0.0023864	0.351	0.948	1.4	18.
12.	-15.0	-19.7	0.030797	0.005285	-0.000819	-0.000663	-0.000542	0.004718	0.0043856	0.0024607	0.352	0.946	1.4	19.
13.	-15.0	-20.2	0.037121	0.007096	-0.000720	-0.001002	-0.000621	0.005476	0.0051423	0.0025442	0.353	0.942	1.4	20.
14.	-12.0	-13.7	0.007753	-0.001318	-0.001049	0.000083	-0.000501	0.002138	0.0018648	0.0023229	0.351	0.949	1.4	14.
15.	-10.0	-12.0	0.017538	0.000217	-0.000848	-0.000012	-0.000439	0.002618	0.0023659	0.0022693	0.352	0.944	1.2	14.
16.	-5.0	-9.7	0.062710	0.002421	-0.001729	0.000130	-0.000877	0.004213	0.0038612	0.0027506	0.352	0.948	.8	16.
17.	-5.0	-11.5	0.076562	0.004513	-0.002254	-0.000013	-0.000830	0.005617	0.0053103	0.0033419	0.350	0.949	.5	18.
18.	-2.0	-5.9	0.062374	-0.000711	-0.002381	0.000568	-0.000803	0.002948	0.0027114	0.0027041	0.351	0.947	.6	14.
19.	-2.0	-7.5	0.079165	0.000283	-0.003070	0.000578	-0.000705	0.004019	0.0037632	0.0032504	0.352	0.945	.3	16.
20.	-2.0	-4.4	0.045218	-0.001351	-0.002061	0.000592	-0.000553	0.002353	0.0021384	0.0024768	0.351	0.947	.9	12.
21.	0.0	-2.6	0.058889	-0.003087	-0.002742	0.000706	-0.000630	0.002012	0.0018369	0.0026923	0.351	0.945	.6	12.
22.	0.0	-4.6	0.073448	-0.002651	-0.003250	0.000789	-0.000838	0.002670	0.0024273	0.0030013	0.351	0.948	.5	14.
23.	0.0	-6.2	0.088303	-0.001686	-0.003768	0.000776	-0.000327	0.003905	0.0036678	0.0037513	0.353	0.943	.2	16.

TEST 288.0 RUN 9

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
17.	-5.0	-6.7	0.031134	-0.000297	-0.001281	0.000228	-0.000600	0.002520	0.0023505	0.0023903	0.350	0.952	1.0	12.
18.	-5.0	-7.3	0.039128	0.000390	-0.001436	0.000259	-0.000629	0.002841	0.0026562	0.0024181	0.350	0.952	.9	13.
19.	-5.0	-8.0	0.047723	0.000977	-0.001703	0.000260	-0.000724	0.003201	0.0030121	0.0025194	0.350	0.953	.7	14.
20.	-5.0	-8.8	0.054762	0.001740	-0.001519	0.000139	-0.000879	0.003638	0.0034247	0.0026168	0.350	0.952	1.0	15.
21.	-7.0	-9.5	0.035794	0.001404	-0.001157	0.000140	-0.000782	0.003157	0.0029789	0.0024025	0.350	0.951	1.0	14.
22.	-7.0	-11.0	0.052213	0.003468	-0.001222	-0.000087	-0.000798	0.004248	0.0040282	0.0026320	0.351	0.952	.8	16.
23.	-7.0	-12.7	0.067350	0.005770	-0.001482	-0.000247	-0.000935	0.005531	0.0053056	0.0029793	0.351	0.951	.7	18.
24.	-7.0	-8.3	0.018210	-0.000447	-0.000932	0.000119	-0.000618	0.002282	0.0021117	0.0022457	0.349	0.949	1.0	12.
25.	-7.0	-7.5	0.009631	-0.001367	-0.000894	0.000129	-0.000481	0.001992	0.0018379	0.0023117	0.351	0.949	1.1	11.
26.	-10.0	-13.5	0.034463	0.003144	-0.000529	-0.000209	-0.000585	0.003847	0.0036614	0.0024824	0.350	0.955	.9	16.
27.	-10.0	-14.1	0.041936	0.004585	-0.000576	-0.000395	-0.000670	0.004478	0.0042771	0.0025484	0.352	0.952	.9	17.
28.	-10.0	-15.0	0.049159	0.006084	-0.000493	-0.000620	-0.000690	0.005135	0.0049765	0.0026772	0.352	0.952	1.0	18.
29.	-10.0	-15.6	0.058559	0.007722	-0.000939	-0.000748	-0.000684	0.006082	0.0058661	0.0029206	0.352	0.953	.8	19.

Table I - 7. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.00

TEST 288.0 RUN 12

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M•AT	A_{1_s}	θ_{grip}
1.	-9.0	-11.8	0.033323	0.000827	-0.000727	-0.000219	-0.001077	0.004215	0.0039455	0.0035807	0.353	0.996	1.1	15.
2.	-9.0	-11.0	0.025396	-0.000811	-0.000785	0.000069	-0.001559	0.003927	0.0034541	0.0036952	0.350	1.003	1.1	14.
3.	-9.0	-12.2	0.042084	0.001623	-0.000843	-0.000028	-0.001649	0.005144	0.0046901	0.0040024	0.352	0.998	.9	16.
4.	-9.0	-13.0	0.049369	0.002692	-0.001037	-0.000157	-0.001827	0.005831	0.0052669	0.0041622	0.350	1.002	.7	17.
5.	-9.0	-10.0	0.017947	-0.001739	-0.000718	0.000038	-0.001351	0.003414	0.0030550	0.0036407	0.349	1.003	1.2	13.
6.	-9.0	-9.9	0.009032	-0.002730	-0.000649	-0.000013	-0.000928	0.002947	0.0026392	0.0035910	0.351	1.003	1.2	12.
7.	-12.0	-14.6	0.025147	0.000798	-0.000556	-0.000371	-0.001070	0.004279	0.0039233	0.0036021	0.350	1.002	1.2	16.
8.	-12.0	-15.3	0.032855	0.002395	-0.000609	-0.000435	-0.001171	0.005009	0.0046374	0.0037264	0.351	1.003	1.0	17.
9.	-12.0	-14.0	0.017319	-0.000546	-0.000522	-0.000345	-0.000835	0.003585	0.0033202	0.0034907	0.349	1.002	1.0	15.
10.	-12.0	-13.2	0.010439	-0.001898	-0.000706	-0.000117	-0.000667	0.002998	0.0027449	0.0034045	0.351	1.001	1.4	14.
11.	-12.0	-12.5	0.002874	-0.003202	-0.000578	-0.000086	-0.000557	0.002472	0.0022915	0.0034094	0.349	1.003	1.2	13.
12.	-15.0	-17.1	0.010694	-0.001387	-0.000536	-0.000467	-0.000468	0.003271	0.0030216	0.0035011	0.351	1.002	1.2	16.
13.	-15.0	-17.7	0.018403	0.000538	-0.000664	-0.000597	-0.000643	0.004085	0.0037167	0.0035061	0.350	1.005	1.1	17.
14.	-15.0	-18.4	0.026390	0.002529	-0.000558	-0.000729	-0.000816	0.004939	0.0046215	0.0036841	0.353	0.999	1.1	18.
15.	-15.0	-16.4	0.003068	-0.003257	-0.000691	-0.000311	-0.000352	0.002608	0.0024016	0.0035458	0.351	1.001	1.4	15.
16.	-12.0	-16.0	0.038999	0.003802	-0.000569	-0.000645	-0.001069	0.005695	0.0054239	0.0039863	0.352	1.002	1.0	17.7
17.	-13.0	-16.8	0.038004	0.003998	-0.000693	-0.000687	-0.001030	0.005746	0.0054200	0.0039164	0.352	1.000	1.0	18.
18.	-14.0	-17.8	0.030445	0.003164	-0.000471	-0.000834	-0.000891	0.005150	0.0048459	0.0036754	0.351	1.003	1.0	18.
19.	-6.0	-8.1	0.041862	-0.000306	-0.001239	0.000229	-0.001047	0.004123	0.0038953	0.0038879	0.352	0.999	.9	14.
20.	-6.0	-8.9	0.051300	0.000467	-0.001388	0.000118	-0.001171	0.004731	0.0044717	0.0041339	0.352	1.000	.8	15.
21.	-6.0	-9.7	0.059704	0.001236	-0.001691	0.000101	-0.001216	0.005413	0.0050797	0.0044094	0.353	1.000	.6	16.
22.	-6.0	-7.4	0.035716	-0.000961	-0.001114	0.000122	-0.000943	0.003733	0.0035176	0.0037708	0.351	1.001	.9	13.
23.	-6.0	-6.7	0.026919	-0.001558	-0.001070	0.000143	-0.000898	0.003338	0.0031455	0.0036451	0.351	0.999	1.0	12.
24.	-6.0	-6.2	0.018195	-0.002151	-0.000954	0.000157	-0.000889	0.003034	0.0028604	0.0035936	0.351	1.002	1.0	11.
25.	-3.0	-6.0	0.059447	-0.001873	-0.002166	0.000539	-0.001310	0.004080	0.0037743	0.0041984	0.351	1.002	.7	14.
26.	-3.0	-6.5	0.067565	-0.001496	-0.002150	0.000481	-0.001221	0.004678	0.0043512	0.0045747	0.351	1.001	.5	15.
27.	-3.0	-5.1	0.050920	-0.002331	-0.002049	0.000610	-0.001306	0.003675	0.0034094	0.0040569	0.351	1.001	.6	13.
28.	-3.0	-4.3	0.043578	-0.002687	-0.001780	0.000532	-0.001225	0.003412	0.0031367	0.0039571	0.352	1.001	.7	12.
29.	-3.0	-3.7	0.034536	-0.002878	-0.001442	0.000469	-0.001178	0.003158	0.0028711	0.0038061	0.352	1.001	.8	11.

Table I - 8. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.02

TEST 288.0 RUN 15

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-12.0	-15.4	0.033266	0.002486	-0.000149	-0.000682	-0.000636	0.005051	0.0048940	0.0039453	0.352	1.017	1.1	17.
2.	-12.0	-15.2	0.033456	0.002440	-0.000254	-0.000711	-0.000565	0.005221	0.0050280	0.0041001	0.350	1.024	1.0	17.
3.	-12.0	-14.4	0.027293	0.001019	-0.000078	-0.000628	-0.000575	0.004575	0.0044401	0.0040337	0.351	1.022	1.1	16.
4.	-12.0	-13.5	0.019153	-0.000654	-0.000094	-0.000480	-0.000619	0.003890	0.0037679	0.0039728	0.350	1.020	1.2	15.
5.	-12.0	-12.8	0.012027	-0.002102	-0.000037	-0.000441	-0.000679	0.003352	0.0032532	0.0039835	0.352	1.020	1.2	14.
6.	-9.0	-10.2	0.027565	-0.000529	-0.000209	-0.000366	-0.000641	0.004066	0.0039589	0.0040952	0.352	1.022	1.1	14.
7.	-9.0	-9.6	0.019757	-0.001608	-0.000113	-0.000287	-0.000752	0.003633	0.0035342	0.0040719	0.351	1.023	1.0	13.
8.	-9.0	-11.2	0.034926	0.000655	-0.000228	-0.000387	-0.000508	0.004618	0.0044838	0.0041728	0.352	1.020	.9	15.
9.	-9.0	-12.1	0.043378	0.001949	-0.000182	-0.000581	-0.000592	0.005289	0.0051267	0.0043174	0.352	1.022	.8	16.
10.	-15.0	-16.7	0.011735	-0.001590	0.000151	-0.000711	-0.000492	0.003573	0.0034880	0.0040354	0.350	1.024	1.4	16.
11.	-15.0	-17.3	0.019647	0.000485	0.000070	-0.000818	-0.000460	0.004332	0.0042214	0.0040258	0.350	1.024	1.2	17.
12.	-15.0	-18.1	0.026347	0.002357	0.000275	-0.001081	-0.000405	0.004974	0.0048822	0.0040085	0.351	1.022	1.1	18.
13.	-13.0	-16.8	0.031172	0.003843	0.000278	-0.001248	-0.000586	0.005724	0.0056354	0.0042210	0.351	1.024	1.0	18.8
14.	-13.0	-15.9	0.029001	0.001986	-0.000060	-0.000803	-0.000390	0.005001	0.0048362	0.0040849	0.350	1.023	1.1	17.

Table I - 9. Rotor No. 1, V/OR = .40, M(1.0, 90) = .85

TEST 288.0 RUN 7

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-4.0	-12.2	0.076035	0.002944	-0.002899	0.000536	-0.001161	0.004894	0.0046721	0.0031566	0.401	0.845	.7	18.
2.	-4.0	-13.1	0.081044	0.004087	-0.002909	0.000369	-0.001344	0.005704	0.0054607	0.0034570	0.396	0.853	.6	19.
3.	-4.0	-14.0	0.085398	0.005007	-0.003104	0.000360	-0.001309	0.006660	0.0063572	0.0039386	0.398	0.850	-1.2	20.
4.	-4.0	-3.3	-0.001140	-0.002049	-0.001617	0.000459	-0.001158	0.001326	0.0012329	0.0020498	0.399	0.849	1.1	8.
5.	-2.0	-5.0	0.043550	-0.001147	-0.002479	0.000723	-0.000340	0.001950	0.0018345	0.0021776	0.396	0.853	.8	12.
6.	-2.0	-3.5	0.027193	-0.001475	-0.002198	0.000757	-0.000144	0.001537	0.0014878	0.0020319	0.398	0.848	1.0	10.
7.	-2.0	-2.0	0.010925	-0.001746	-0.001868	0.000520	-0.000159	0.001451	0.0012590	0.0019500	0.400	0.847	1.1	8.
8.	-2.0	-9.9	0.080477	0.001158	-0.003413	0.000652	-0.000710	0.004190	0.0039995	0.0031609	0.398	0.850	.6	17.
9.	-2.0	-11.0	0.084170	0.002159	-0.003762	0.000639	-0.000697	0.005017	0.0047251	0.0034531	0.398	0.851	.3	18.
10.	0.0	-7.6	0.083656	-0.001384	-0.004335	0.000830	-0.000698	0.003334	0.0031181	0.0032624	0.399	0.848	.3	16.
11.	0.0	-8.8	0.087839	-0.000399	-0.004628	0.000848	-0.000786	0.004182	0.0039876	0.0036971	0.398	0.849	.2	17.
12.	0.0	-9.7	0.092076	0.000599	-0.004998	0.001015	-0.000711	0.005188	0.0049452	0.0042128	0.398	0.849	0.0	18.
13.	0.0	-9.7	0.071532	-0.002381	-0.004007	0.000971	-0.000722	0.002217	0.0020522	0.0027009	0.398	0.849	.5	14.

TEST 288.0 RUN 5

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-4.0	-8.7	0.039962	0.000916	-0.001126	0.000163	-0.000660	0.002682	0.0025519	0.0020923	0.401	0.852	.9	14.
2.	-4.0	-10.6	0.054461	0.002205	-0.001486	0.000197	-0.000724	0.003519	0.0034048	0.0023582	0.396	0.859	.9	16.
3.	-4.0	-12.5	0.069525	0.003919	-0.001811	0.000052	-0.000767	0.004812	0.0046558	0.0028052	0.401	0.850	.8	18.
4.	-8.0	-15.2	0.047449	0.004913	-0.000205	-0.000535	-0.000592	0.004555	0.0045079	0.0024145	0.399	0.852	1.1	18.
5.	-8.0	-16.8	0.058799	0.007126	-0.000214	-0.000687	-0.000841	0.005803	0.0057593	0.0027279	0.397	0.857	1.0	20.
6.	-12.0	-17.8	0.025729	0.002908	0.000153	-0.000588	-0.000624	0.003415	0.0034310	0.0022373	0.397	0.856	1.4	18.
7.	-12.0	-19.4	0.038319	0.005997	0.000133	-0.000789	-0.000652	0.005017	0.0049311	0.0024533	0.399	0.853	1.4	20.

Table I - 10. Rotor No. 1, V/OR = .40, M(1.0, 90) = .95

TEST 288.0 RUN 13

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M.AT	A_{1_S}	θ_{grip}
1.	-9.0	-12.4	0.026799	0.000248	-0.000476	0.000015	-0.000510	0.003153	0.0029692	0.0028278	0.404	0.947	1.4	15.
2.	-9.0	-13.1	0.034482	0.001380	-0.000664	0.000062	-0.000378	0.003801	0.0035756	0.0029505	0.404	0.948	1.2	16.
3.	-9.0	-11.6	0.019715	-0.000792	-0.000632	0.000142	-0.000491	0.002677	0.0024827	0.0027799	0.403	0.948	1.4	14.
4.	-9.0	-10.9	0.012847	-0.001753	-0.000612	0.000167	-0.000265	0.002235	0.0020720	0.0027713	0.404	0.948	1.4	13.
5.	-12.0	-14.6	0.011369	-0.001578	-0.000292	-0.000029	-0.000289	0.002349	0.0022478	0.0028776	0.404	0.947	1.4	15.
6.	-12.0	-15.2	0.018260	-0.000168	-0.000298	-0.000088	-0.000302	0.002997	0.0028871	0.0029358	0.404	0.948	1.4	16.
7.	-12.0	-16.1	0.025255	0.001360	-0.000231	-0.000294	-0.000323	0.003587	0.0034642	0.0028801	0.402	0.949	1.2	17.
8.	-12.0	-16.8	0.031335	0.002680	-0.000377	-0.000302	-0.000301	0.004371	0.0041741	0.0030321	0.405	0.947	1.4	18.
9.	-12.0	-17.7	0.038236	0.003964	-0.000419	-0.000564	-0.000720	0.005229	0.0049655	0.0032789	0.404	0.947	1.2	19.
10.	-12.0	-13.9	0.003491	-0.003199	-0.000383	0.000065	-0.000448	0.001716	0.0016124	0.0029049	0.404	0.946	1.4	14.
11.	-15.0	-18.3	0.009813	-0.001550	-0.000400	-0.000282	-0.000137	0.002576	0.0023729	0.0029920	0.403	0.948	1.5	17.
12.	-15.0	-19.0	0.015745	0.000067	-0.000369	-0.000449	-0.000137	0.003244	0.0030826	0.0030413	0.402	0.951	1.5	18.
13.	-15.0	-19.7	0.022658	0.001875	-0.000356	-0.000616	-0.000160	0.003992	0.0038494	0.0030683	0.401	0.952	1.4	19.
14.	-15.0	-17.8	0.001979	-0.003535	-0.000298	-0.000125	-0.000077	0.001663	0.0015594	0.0029771	0.401	0.950	1.4	16.
15.	-7.0	-9.8	0.031850	-0.000098	-0.000798	0.000127	-0.000559	0.003122	0.0028643	0.0028453	0.403	0.949	1.2	14.
16.	-7.0	-10.8	0.038698	0.000707	-0.000805	0.000029	-0.000632	0.003640	0.0034714	0.0031002	0.403	0.946	1.1	15.
17.	-8.0	-13.1	0.068878	0.008818	-0.000989	-0.000472	-0.000410	0.004788	0.0045908	0.0017941	0.271	0.899	.1	17.5
18.	-8.0	-13.1	0.076147	0.009367	-0.001240	-0.000553	-0.000322	0.005175	0.0049512	0.0019266	0.270	0.903	.1	18.
19.	-9.0	-14.1	0.070359	0.010038	-0.001078	-0.000646	-0.000306	0.005169	0.0049530	0.0018057	0.271	0.900	0	18.
20.	-9.0	-14.1	0.078458	0.010825	-0.001114	-0.000747	-0.000350	0.005673	0.0054274	0.0019662	0.271	0.902	0	18.5
21.	-9.0	-14.1	0.060621	0.008900	-0.001040	-0.000561	-0.000274	0.004643	0.0044128	0.0016777	0.272	0.900	0	17.4
22.	-8.0	-13.1	0.061572	0.008165	-0.001137	-0.000495	-0.000215	0.004414	0.0042123	0.0016780	0.271	0.899	0	17.
23.	-7.0	-12.1	0.068607	0.007654	-0.001374	-0.000317	-0.000242	0.004458	0.0042473	0.0017745	0.270	0.900	0	17.
24.	-7.0	-12.1	0.060242	0.007002	-0.001329	-0.000281	-0.000224	0.004072	0.0038749	0.0016750	0.270	0.901	0	16.5
25.	-7.0	-12.1	0.078066	0.008292	-0.001473	-0.000359	-0.000386	0.004914	0.0046655	0.0018986	0.271	0.898	0	17.5
26.	-8.0	-14.1	0.058392	0.009050	-0.001354	-0.000501	-0.000145	0.004618	0.0044192	0.0016665	0.272	0.901	- .2	17.5
27.	-8.0	-15.1	0.053097	0.008906	-0.001399	-0.000495	-0.000140	0.004452	0.0042676	0.0016138	0.271	0.904	- .3	17.5
28.	-9.0	-16.1	0.048024	0.008864	-0.001313	-0.000533	-0.000216	0.004359	0.0041729	0.0015741	0.271	0.902	- .3	17.5
29.	-9.0	-13.8	0.063446	0.009130	-0.000433	-0.000601	-0.000402	0.004719	0.0045097	0.0016916	0.271	0.901	.7	17.5
30.	-9.0	-12.8	0.072598	0.008736	-0.000308	-0.000619	-0.000508	0.004857	0.0046241	0.0018186	0.269	0.904	.6	17.5
31.	-9.0	-11.8	0.082280	0.008238	-0.000331	-0.000585	-0.000569	0.005049	0.0048281	0.0020242	0.270	0.902	.6	17.5
32.	-8.0	-10.8	0.088077	0.007250	-0.000288	-0.000474	-0.000577	0.005038	0.0048064	0.0021886	0.269	0.904	.6	17.5
33.	-8.0	-12.8	0.069151	0.008831	-0.000780	-0.000531	-0.000255	0.004823	0.0045954	0.0017889	0.272	0.902	.2	17.5

Table I - 11. Rotor No. 2.

TEST 31[illegible] RUN 3

44 FT. TAPERED TIP ROTOR V/OR = .31 M(1.0)(90) = .87

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	8.[illegible]	-1.[illegible]	-14.8	.[illegible]35538	[illegible].[illegible]5 54	[illegible].[illegible]0115	-[illegible].[illegible]0744	-[illegible].[illegible]1566	0.[illegible]03618	[illegible].0037269	0.0020327	0.315	0.871	.2
2.	8.[illegible]	-1[illegible].[illegible]	-13.1	.[illegible]17023	[illegible].[illegible]1594	[illegible].[illegible]0171	-[illegible].[illegible]0349	-[illegible].[illegible]0503	0.[illegible]02133	[illegible].[illegible]22866	[illegible].0017574	0.318	0.873	.3
3.	1[illegible].[illegible]	-1[illegible].[illegible]	-16.2	.[illegible]5 949	[illegible].[illegible]8489	-[illegible].[illegible]3[illegible]85	-[illegible].[illegible] 1751	-[illegible].[illegible]784	[illegible].[illegible]25[illegible]1[illegible]	0.[illegible]52081	0.0023282	0.315	0.878	
4.	12.[illegible]	-1[illegible].[illegible]	-17.8	.[illegible]65884	[illegible]. 12123	-[illegible].[illegible]0311	-[illegible].[illegible]1553	-[illegible].[illegible]1639	0.[illegible]26724	[illegible].[illegible]269399	0.0027607	0.316	0.874	
5.	13.[illegible]	-1[illegible].[illegible]	-16.5	[illegible].[illegible]72497	[illegible].[illegible]13746	-[illegible].[illegible]1598	-[illegible].[illegible]1848	-[illegible].[illegible]1791	0.[illegible]47827	[illegible].0079959	[illegible].0032097	0.318	0.874	.2
6.	13.[illegible]	-15.[illegible]	-20.1	[illegible].[illegible]27827	[illegible].[illegible]16362	[illegible].[illegible]1675	-[illegible].[illegible]1284	-[illegible].[illegible]2678	0.[illegible]33826	[illegible].[illegible]40787	[illegible].0019922	0.318	0.871	.5
7.	8.[illegible]	-15.[illegible]	-18.8	.[illegible]11847	[illegible].[illegible] 1735	[illegible].[illegible]718	-[illegible].[illegible]0686	-[illegible].[illegible]1617	0.[illegible]02324	[illegible].0024187	0.0018551	0.318	0.872	.5
8.	12.[illegible]	-19.[illegible]	-21.5	.[illegible]04313	[illegible].[illegible]11132	[illegible].[illegible]0265	-[illegible].[illegible]1758	-[illegible].[illegible]1687	0.[illegible]05655	[illegible].0059767	0.0022824	0.319	0.872	.3
9.	13.7	-16.[illegible]	-22.9	.[illegible]57129	[illegible].[illegible]15756	[illegible].[illegible]0128	-[illegible].[illegible]2284	-[illegible].[illegible]1808	0.[illegible]07670	[illegible].0079627	0.0026766	0.319	0.872	.2
10.	1[illegible].[illegible]	-5.[illegible]	-12.5	.[illegible]77466	[illegible].[illegible]6873	-[illegible].[illegible]1661	-[illegible].[illegible]633	-[illegible].[illegible]771	0.[illegible]05491	[illegible].0055846	0.0029232	0.318	0.873	.0
11.	1[illegible].[illegible]	-5.[illegible]	-12.5	.[illegible]66792	[illegible].[illegible]5411	-[illegible].[illegible]1837	-[illegible].[illegible]646	[illegible].[illegible]3699	0.[illegible]05618	[illegible].0056548	0.0039951	0.317	0.870	

TEST 310.[illegible] RUN 4

44 FT. TAPERED TIP ROTOR V/CR = M(1.0)(90) =

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	1[illegible].[illegible]	-5.[illegible]	-12.5	.[illegible]78224	[illegible].[illegible]6785	-[illegible].[illegible]1812	-[illegible].[illegible]1741	-[illegible].[illegible]1652	[illegible].[illegible]5757	0.[illegible]57858	0.0031134	0.326	0.882	
2.	12.[illegible]	-5.[illegible]	-14.4	.[illegible]64345	[illegible].[illegible]89 4	-[illegible].[illegible]2134	-[illegible].[illegible]1963	-[illegible].[illegible]1[illegible]49[illegible]	0.[illegible]07364	[illegible].[illegible]72771	1.0038450	0.323	0.882	
3.	8.[illegible]	-5.[illegible]	-11.[illegible]	.[illegible]26134	[illegible].[illegible]4494	-[illegible].[illegible]1314	-[illegible].[illegible]1519	-[illegible].[illegible]1552	0.[illegible]14041	[illegible].[illegible]40269	0.0022803	0.323	0.881	
4.	6.[illegible]	-5.[illegible]	-8.7	.[illegible]44557	[illegible].[illegible]240[illegible]	-[illegible].[illegible]748	-[illegible].[illegible]0361	-[illegible].[illegible]1468	0.[illegible]32819	[illegible].[illegible]28483	[illegible].0019121	0.322	0.881	.1
5.	4.[illegible]	-5.[illegible]	-7.6	.[illegible]25168	[illegible].[illegible]734	-[illegible].[illegible]397	-[illegible].[illegible]0288	-[illegible].[illegible]0317	0.[illegible]71922	[illegible].0019223	[illegible].0016364	0.322	0.880	.3
6.	2.[illegible]	-5.[illegible]	-6.9	.[illegible]1[illegible]78	-[illegible].[illegible]763	-[illegible].[illegible]212	-[illegible].[illegible]0179	-[illegible].[illegible]0228	0.[illegible]01314	[illegible].0013165	[illegible].0015470	0.322	0.883	.0
7.	6.[illegible]	[illegible].[illegible]	-5.3	.[illegible]73473	-[illegible].[illegible]6471	-[illegible].[illegible]2323	-[illegible].[illegible]38	-[illegible].[illegible]7823	0.[illegible]92296	[illegible].0023414	[illegible].0040285	0.326	0.880	-.4
8.	6.[illegible]	[illegible].[illegible]	-7.5	.[illegible]84615	-[illegible].[illegible] 5489	-[illegible].[illegible]3431	-[illegible].[illegible].3[illegible]	-[illegible].[illegible]1195	[illegible].[illegible]39[illegible]	[illegible].[illegible]39516	[illegible].0055[illegible]3	0.327	0.878	.6
9.	1[illegible].[illegible]	[illegible].[illegible]	-9.4	.[illegible]9 981	[illegible].[illegible]217	-[illegible].[illegible]383	-[illegible].[illegible]54	-[illegible].[illegible]926	[illegible].[illegible]5768	[illegible].0057726	[illegible].0044232	0.324	0.881	
10.	4.[illegible]	[illegible].[illegible]	-3.6	.[illegible]64761	-[illegible].[illegible] 1819	-[illegible].[illegible] 1515	-[illegible].[illegible]0[illegible]52	-[illegible].[illegible]0[illegible]53	0.[illegible]01475	[illegible].0014429	0.0017978	0.325	0.881	
11.	2.[illegible]	[illegible].[illegible]	-1.7	.[illegible]36[illegible]45	-[illegible].[illegible]1672	-[illegible].[illegible]0951	-[illegible].[illegible]0[illegible]14	-[illegible].[illegible]0431	0.[illegible]01084	[illegible].0010775	[illegible].0015840	0.325	0.880	
12.	[illegible].[illegible]	[illegible].[illegible]	-[illegible].4	.[illegible]19[illegible]7	-[illegible].[illegible] 18 2	-[illegible].[illegible] 552	-[illegible].[illegible]0122	-[illegible].[illegible]0299	0.[illegible]00968	[illegible].0019577	[illegible].0015167	0.327	0.880	.1
13.	-1.[illegible]	[illegible].[illegible]	[illegible].[illegible]	.[illegible]11728	-[illegible].[illegible] 1665	-[illegible].[illegible] 445	-[illegible].[illegible]0123	-[illegible].[illegible]0281	0.[illegible]00998	[illegible].0009591	[illegible].0014866	0.325	0.878	
14.	-2.[illegible]	[illegible].[illegible]	[illegible].7	.[illegible] 326	-[illegible].[illegible] 1451	-[illegible].[illegible] 334	-[illegible].[illegible]0114	-[illegible].[illegible]0161	0.[illegible]01082	[illegible].0010815	[illegible].0015564	0.325	0.878	
15.	2.[illegible]	[illegible].[illegible]	[illegible].	.[illegible]67227	-[illegible].[illegible]6721	-[illegible].[illegible]2475	[illegible].[illegible]3[illegible]	-[illegible].[illegible]2933	-0.[illegible]00392	-0.[illegible]0003863	[illegible].0020872	0.324	0.879	
16.	4.[illegible]	[illegible].[illegible]	[illegible].1	.[illegible] 83424	-[illegible].[illegible] 98[illegible]	-[illegible].[illegible]2799	[illegible].[illegible]147	-[illegible].[illegible]2951	[illegible].[illegible]7266	0.[illegible]0[illegible]3356	[illegible].0027927	0.326	0.879	-.3
17.	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	.[illegible]4 27	-[illegible].[illegible] 7[illegible]4	-[illegible].[illegible] 1913	.[illegible]28	-[illegible].[illegible]81[illegible]	-0.[illegible]0[illegible]1350	-0.[illegible]0[illegible]3461	[illegible].0017859	0.325	0.878	.0
18.	-2.[illegible]	[illegible].[illegible]	[illegible].	.[illegible]3 293	-[illegible].[illegible]5831	-[illegible].[illegible] 127[illegible]	[illegible].[illegible]123	-[illegible].[illegible]0325	-0.[illegible]0[illegible]157	-0.[illegible]0[illegible]1203	[illegible].0016483	0.327	0.881	

Table I - 12. Rotor No. 2.

TEST 312. RUN 5

44 FT. TAPERED TIP ROTOR V/OR = .36 M(1.0)(90) = .80

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	4.	-1[illegible]	-11.6	[illegible]2547	-[illegible]1193	[illegible]336	-[illegible]3391	-[illegible]1364	[illegible]1209	[illegible]2286	0.0015727	0.315	0.877	.4
2.	8.	-1[illegible]	-14.5	[illegible]33185	[illegible]4273	[illegible]181	-[illegible]0761	-[illegible]1512	[illegible]3411	[illegible]3463[illegible]	0.0018952	0.340	0.832	.4
3.	8.	-1[illegible]	-14.5	[illegible]29159	[illegible]3464	[illegible]0164	-[illegible]6666	-[illegible]0544	[illegible]3228	[illegible]3354	0.0020004	0.360	0.797	.4
4.	1[illegible]	-1[illegible]	-16.1	[illegible]44578	[illegible]6635	[illegible]0114	-[illegible]1381	-[illegible]762[illegible]	[illegible]4784	0.0048156	0.0022669	0.360	0.798	.2
5.	12.[illegible]	-1[illegible]	-17.5	[illegible]56819	[illegible]9745	-[illegible]0162	-[illegible]1384	-[illegible]0767	[illegible]6341	[illegible]3762	0.0026317	0.359	0.797	.2
6.	13.7	-1[illegible]	-19.7	[illegible]65765	[illegible]3185	-[illegible]0314	-[illegible]1876	-[illegible]0768	[illegible]8229	[illegible]0951	0.0030287	0.359	0.800	.1
7.	13.7	-15.[illegible]	-22.8	[illegible]48358	[illegible]2167	[illegible]0425	-[illegible]2136	-[illegible]0839	[illegible]6869	[illegible]6876	0.0024439	0.360	0.796	.5
8.	12.[illegible]	-15.[illegible]	-21.3	[illegible]3885[illegible]	[illegible]7618	[illegible]687	-[illegible]1631	-[illegible]794	[illegible]4826	[illegible]5413	0.0022428	0.357	0.798	.7
9.	1[illegible]	-15.[illegible]	-2[illegible].1	[illegible]19238	[illegible]3311	[illegible]757	-[illegible]1116	-[illegible]0886	[illegible]3176	[illegible]2915	0.0020677	0.362	0.794	.7
10.	8.[illegible]	-15.[illegible]	-18.8	[illegible]3249	-[illegible]1286	[illegible]0676	-[illegible]1485	-[illegible]0644	[illegible]1359	[illegible]1492[illegible]	0.0019559	0.361	0.796	.7
11.	6.[illegible]	-15.[illegible]	-17.1	-[illegible]2248	-[illegible]5843	[illegible]836	-[illegible]0141	-[illegible]1131	-[illegible]0170	-[illegible]0[illegible]790	0.0020237	0.362	0.794	.6
12.	6.[illegible]	-1[illegible]	-13.[illegible]	[illegible]1153	[illegible]215	[illegible]352	-[illegible]0422	-[illegible]0446	[illegible]1886	[illegible]9225	0.0018355	0.363	0.795	.5
13.	4.	-1[illegible]	-11.6	-[illegible]5155	-[illegible].2724	[illegible]398	-[illegible]0375	-[illegible]1431	[illegible]0771	[illegible]8077	0.0017858	0.360	0.797	.5
14.	4.[illegible]	-5.[illegible]	-7.2	[illegible]22682	[illegible]1262	-[illegible]0367	-[illegible]0122	-[illegible]0327	[illegible]1846	[illegible]0217	0.0017715	0.359	0.797	.3
15.	2.[illegible]	-5.[illegible]	-6.[illegible]	[illegible]3834	-[illegible]1322	-[illegible]0169	-[illegible]0079	-[illegible]0173	[illegible]1213	[illegible]1936	0.0016713	0.362	0.791	.4
16.	6.[illegible]	-5.[illegible]	-9.[illegible]	[illegible]4163[illegible]	[illegible]1943	-[illegible]0[illegible]764	-[illegible]0[illegible]2 3	-[illegible]0[illegible]515	[illegible]2785	[illegible]8382	0.0020129	0.362	0.792	.1
17.	6.[illegible]	-5.[illegible]	-1[illegible].8	[illegible]59[illegible]28	[illegible]3714	-[illegible]1[illegible]75	-[illegible]0042[illegible]	-[illegible]0494	[illegible]3863	[illegible]8872	0.0023132	0.357	0.801	.1
18.	12.[illegible]	-5.[illegible]	-12.5	[illegible]74771	[illegible]5883	-[illegible]1619	-[illegible]0603	-[illegible]0611	[illegible]5471	[illegible]4037	0.0028822	0.362	0.793	
19.	12.[illegible]	-5.[illegible]	-14.5	[illegible]84792	[illegible]8389	-[illegible]1[illegible]2[illegible]3	-[illegible]0786	-[illegible]0[illegible]923	[illegible]7329	[illegible]1613	0.0036164	0.363	0.793	
20.	8.[illegible]	[illegible]	-7.5	[illegible]6325[illegible]	-[illegible]1[illegible]38	-[illegible]2836	-[illegible]0[illegible]12	-[illegible]0[illegible]434	[illegible]3497	[illegible]4888[illegible]	0.0031338	0.358	0.799	
21.	1[illegible]	[illegible]	-9.3	[illegible]91238	[illegible]1275	-[illegible]3661	-[illegible]0[illegible]785	-[illegible]0[illegible]1[illegible]53	[illegible]5367	[illegible]0052969	0.0042523	0.358	0.799	
22.	6.[illegible]	[illegible]	-5.5	[illegible]6[illegible]9596	-[illegible]1577	-[illegible]0217[illegible]	[illegible]0[illegible]42	-[illegible]0[illegible]602	[illegible]2287	[illegible]0020965	0.0023175	0.358	0.798	
23.	4.[illegible]	[illegible]	-3.6	[illegible]3228[illegible]	-[illegible]1577	-[illegible]0[illegible]133[illegible]	-[illegible]0[illegible]26	-[illegible]0[illegible]458	[illegible]1329	[illegible]0014235	0.0019371	0.358	0.798	.1
24.	2.	[illegible]	-2.[illegible]	[illegible]32659	-[illegible]1927	-[illegible]0[illegible]812	-[illegible]0[illegible]38	-[illegible]0[illegible]427	[illegible]1018	[illegible]0011152	0.0017313	0.359	0.798	
25.	[illegible]	[illegible]	-[illegible].5	[illegible]17333	-[illegible]1928	-[illegible]0[illegible]495	[illegible]0[illegible]21	-[illegible]0[illegible]191	[illegible]0955	[illegible]0009885	0.0016659	0.362	0.789	.2
26.	[illegible]	5.	3.7	[illegible]47161	-[illegible].6957	-[illegible]0[illegible]1825	[illegible]0[illegible]933	-[illegible]0[illegible]452	-[illegible]0[illegible]532	-[illegible]0[illegible]4409	0.0018985	0.359	0.798	-.2
27.	2.[illegible]	5.	2.[illegible]	[illegible]64779	-[illegible]. 8559	-[illegible]0[illegible]2587	[illegible]0[illegible]784	-[illegible]0[illegible]631	-[illegible]0[illegible]593	-[illegible]0[illegible]4898	0.0022740	0.358	0.800	
28.	3.[illegible]	5.	[illegible].9	[illegible]73148	-[illegible]. 8973	-[illegible]0[illegible]2836	[illegible]0[illegible]111	-[illegible]0[illegible]717	-[illegible]0[illegible]463	-[illegible]0[illegible]3371	0.0024995	0.358	0.798	
29.	4.	5.	- .1	[illegible]81389	-[illegible].9195	-[illegible].[illegible]3777	[illegible].[illegible]2[illegible]5	-[illegible].[illegible]1653	-[illegible]0[illegible]1070	[illegible]0[illegible]773	0.0028920	0.357	0.800	
30.	6.[illegible]	5.	-2.3	[illegible]92988	-[illegible].8433	-[illegible]0[illegible]4618	[illegible].[illegible]0363	-[illegible].[illegible]0448	[illegible]1457	[illegible]5848	0.0040187	0.359	0.798	

Table I-12. (Concluded)

TEST 310.0 RUN 13

44 FT. TAPERED TIP ROTOR V/OR = M(1.0)(90) =

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.010839	-0.001700	-0.000294	-0.000017	-0.000156	0.000977	0.0009120	0.0015105	0.357	0.801	.2
2.	0.0	2.0	1.0	0.025145	-0.003071	-0.000796	0.000113	-0.000605	0.000652	0.0005910	0.0016373	0.355	0.804	.2
3.	0.0	4.0	3.0	0.039969	-0.005558	-0.001162	0.000014	-0.000450	-0.000006	-0.0000360	0.0018180	0.354	0.804	.2
4.	0.0	6.0	5.0	0.056740	-0.010104	-0.001785	-0.000095	-0.000703	-0.001192	-0.0010753	0.0022838	0.355	0.803	.2
5.	-2.0	6.0	5.0	0.028082	-0.005137	-0.001210	0.000052	-0.000388	0.000020	-0.0000121	0.0017575	0.355	0.803	.2
6.	-2.0	4.0	3.0	0.015648	-0.003010	-0.000822	0.000177	-0.000286	0.000635	0.0005438	0.0015986	0.356	0.803	.2
7.	2.0	4.0	3.0	0.077471	-0.012480	-0.002996	0.000046	-0.000873	-0.001225	-0.0010776	0.0029511	0.357	0.803	.5
8.	2.0	6.0	5.0	0.091362	-0.018321	-0.003691	-0.000060	-0.001063	-0.001959	-0.0017555	0.0041860	0.357	0.803	.5
9.	2.0	2.0	1.0	0.059997	-0.007083	-0.002311	0.000129	-0.000903	-0.000138	-0.0000849	0.0021819	0.356	0.802	.5
10.	2.0	0.0	-1.0	0.043201	-0.003374	-0.001509	-0.000007	-0.000478	0.000722	0.0006671	0.0017378	0.357	0.802	.5
11.	4.0	0.0	-1.0	0.076896	-0.007397	-0.002507	0.000085	-0.000818	0.000446	0.0003979	0.0026024	0.355	0.803	.5
12.	4.0	2.0	1.0	0.091649	-0.012877	-0.003290	0.000221	-0.001318	-0.000005	0.0000362	0.0040152	0.355	0.804	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	0	0	- .8	0
2	0	2	- .5	0
3	0	4	0	0
4	0	6	.8	0
5	-2	6	-1.0	0
6	-2	4	-1.4	0
7	2	4	2.4	0
8	2	6	3.6	0
9	2	2	1.8	0
10	2	0	1.2	0
11	4	0	3.4	0
12	4	2	4.3	0

Table I - 13. Rotor No. 2.

TEST 31[illegible] RUN 6

44 FT. TAPERED TIP ROTOR V/OR = .36 M(1.0)(90) = .90

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.[illegible]	-5.	-5.2	.[illegible]	[illegible].1854	-[illegible].000444	-[illegible].000466	-[illegible].000231	[illegible].002853	[illegible].0028525	[illegible].0020750	0.358	0.903	.2
2.	0.[illegible]	-5.	-11.[illegible]	.[illegible]56222	[illegible].3478	-[illegible].000953	-[illegible].000575	-[illegible].000329	[illegible].003994	[illegible].0039511	[illegible].0024877	0.356	0.907	.1
3.	1.[illegible]	-5.	-12.9	.[illegible]69294	[illegible].5613	-[illegible].001424	-[illegible].000614	-[illegible].000217	[illegible].005591	[illegible].0054739	[illegible].0031286	0.357	0.905	.1
4.	4.[illegible]	-5.[illegible]	-7.5	.[illegible]23187	[illegible].000275	-[illegible].000285	-[illegible].000192	-[illegible].000151	[illegible].001914	[illegible].0019744	[illegible].0018377	0.359	0.900	.3
5.	2.[illegible]	-5.[illegible]	-6.[illegible]	.[illegible]2437	-[illegible].1229	-[illegible].000165	-[illegible].000193	[illegible].002576	[illegible].001379	[illegible].0013427	[illegible].0017E83	0.363	0.893	.4
6.	2.[illegible]	[illegible]	-1.9	.[illegible]35448	-[illegible].2184	-[illegible].000928	[illegible].000441	-[illegible].000266	[illegible].001980	[illegible].0010856	[illegible].0017731	0.356	0.908	.1
7.	1.[illegible]	[illegible]	- .6	.[illegible]18462	-[illegible].1963	-[illegible].000959	[illegible].000721	-[illegible].000312	[illegible].000604	[illegible].0010092	[illegible].0016831	0.357	0.907	.1
8.	4.[illegible]	[illegible].[illegible]	-3.6	.[illegible]03813	-[illegible].2156	-[illegible].001465	-[illegible].000221	- .[illegible]192	0.001453	[illegible].0014933	0.0020562	0.356	0.907	.1
9.	6.[illegible]	[illegible].[illegible]	-5.7	.[illegible]07 [illegible]68	-[illegible].1585	-[illegible].002415	[illegible].001742	-[illegible].001424	[illegible].002315	[illegible].0024211	[illegible].0026348	0.355	0.906	
10.	8.[illegible]	[illegible].[illegible]	-7.7	.[illegible]28 655	-[illegible].2321	-[illegible].003212	[illegible].001936	-[illegible].001479	[illegible].003806	[illegible].0037816	[illegible].0034366	0.358	0.904	
11.	4.[illegible]	5.[illegible]	- .5	.[illegible]08 656	-[illegible].9178	-[illegible].[illegible]4[illegible]	[illegible].001371	-[illegible].000517	[illegible].002444	[illegible].0024673	[illegible].0032226	0.357	0.903	
12.	6.[illegible]	5.[illegible]	-2.6	.[illegible]84993	-[illegible].7871	-[illegible].004628	[illegible].003384	-[illegible].001636	[illegible].002146	[illegible].0021403	[illegible].0043830	0.356	0.906	
13.	2.[illegible]	5.[illegible]	1.5	1.[illegible]67758	-[illegible].[illegible]92[illegible]6	-[illegible].[illegible]29[illegible]	[illegible].000133	-[illegible].000581	-[illegible].000497	-[illegible].0000818	[illegible].0028936	0.358	0.902	
14.	[illegible].[illegible]	5.[illegible]	3.3	.[illegible]351862	-[illegible].[illegible]7964	-[illegible].[illegible]1227[illegible]	[illegible].[illegible]0[illegible]59	-[illegible].[illegible]0411	-[illegible].000459	-[illegible].0004889	[illegible].0021703	0.358	0.903	
15.	-2.[illegible]	6.[illegible]	5.[illegible]	.[illegible]34353	-[illegible].[illegible].628[illegible]	-[illegible].[illegible]154	[illegible].[illegible]0[illegible]18[illegible]	-[illegible].[illegible]00731	-[illegible].[illegible]00252	-[illegible].[illegible]002026	[illegible].0019528	0.357	0.905	
16.	-2.[illegible]	7.[illegible]	6.4	.[illegible]46914	-[illegible].[illegible]9233	-[illegible].[illegible]2117	[illegible].[illegible]114	-[illegible].[illegible]826	-[illegible].[illegible]00969	-[illegible].0011133	[illegible].0021338	0.357	0.905	-.2
17.	[illegible].[illegible]	7.[illegible]	4.6	.[illegible]63938	-[illegible].11611	-[illegible].[illegible]0[illegible]32 6	[illegible].[illegible]0143	-[illegible].[illegible]0572	-[illegible].[illegible]01[illegible]2	-[illegible].[illegible]1014262	[illegible].0024432	0.358	0.903	
18.	2.[illegible]	7.[illegible]	2.8	.[illegible]76887	-[illegible].12933	-[illegible].[illegible]04211	[illegible].[illegible]0151	-[illegible].[illegible]939	-[illegible].[illegible]01042	-[illegible].[illegible]0[illegible]9731	[illegible].0032122	0.357	0.905	-.5
19.	4.[illegible]	7.[illegible]	.8	.[illegible]66[illegible]14	-[illegible].12375	-[illegible].[illegible]4916	[illegible].[illegible]7171	-[illegible].[illegible]1586	[illegible].[illegible]0359	[illegible].[illegible]0[illegible]325[illegible]	[illegible].0042195	0.359	0.905	
20.	6.[illegible]	-1[illegible].[illegible]	-13.[illegible]	.[illegible]13294	[illegible].922[illegible]	.[illegible]321	-[illegible].[illegible]554	-[illegible].[illegible]298	[illegible].[illegible]2165	[illegible].0022513	[illegible].0019464	0.356	0.908	.5
21.	8.[illegible]	-1[illegible].[illegible]	-14.4	.[illegible]03 952	[illegible].3882	[illegible].[illegible]241	-[illegible].[illegible]839	-[illegible].[illegible]312	[illegible].[illegible]3520	[illegible].0034992	[illegible].0020440	0.357	0.903	.5
22.	1.[illegible]	-1[illegible].[illegible]	-16.1	.[illegible]44177	[illegible].5651	.[illegible]1316	-[illegible].[illegible]3155	-[illegible].[illegible]2185	[illegible].004399	[illegible].0048323	[illegible].0026110	0.356	0.907	.4
23.	11.[illegible]	-1[illegible].[illegible]	-17.[illegible]	.[illegible]52661	.[illegible]8413	-[illegible].[illegible]245	-[illegible].[illegible]1152	-[illegible].[illegible]717	[illegible].[illegible]5762	[illegible].[illegible]56255	[illegible].0024181	0.358	0.903	.4
24.	11.[illegible]	-1[illegible].[illegible]	-2[illegible].6	.[illegible]26465	[illegible].5456	.[illegible]1[illegible]66	-[illegible].[illegible]1811	-[illegible].[illegible]1632	[illegible].[illegible]4178	[illegible].[illegible]41990	[illegible].0021842	0.358	0.903	.6
25.	12.[illegible]	-1[illegible].[illegible]	-21.3	.[illegible]33747	[illegible].7839	[illegible].[illegible]44[illegible]	-[illegible].[illegible]1545	-[illegible].[illegible]1546	[illegible].[illegible]5146	[illegible].[illegible]51325	[illegible].0022590	0.356	0.906	.6
26.	1[illegible].[illegible]	-1[illegible].[illegible]	-2[illegible].[illegible]	.[illegible]2 279	[illegible].3771	[illegible].[illegible]71[illegible]	-[illegible].[illegible]1228	-[illegible].[illegible]1515	[illegible].[illegible]3437	[illegible].[illegible]34827	[illegible].0021347	0.358	0.906	.7
27.	8.[illegible]	-1[illegible].[illegible]	-18.[illegible]	.[illegible]6811	-[illegible].[illegible]441	[illegible].[illegible]552	-[illegible].[illegible]1567	-[illegible].[illegible]1523	[illegible].[illegible]1716	[illegible].[illegible]18218	[illegible].0019765	0.356	0.905	.6

Table I - 14. Rotor No. 2.

TEST 310.0 RUN 16

44 FT. TAPERED TIP ROTOR V/OR = .40 M(1.0)(90) = .83

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.6	0.033264	0.000880	-0.000562	-0.000270	-0.000112	0.002611	0.0023882	0.0019644	0.403	0.828	.1
2.	6.0	5.0	-3.4	0.085627	-0.007955	-0.004783	0.000416	-0.000415	0.001639	0.0014509	0.0041671	0.400	0.828	
3.	4.0	5.0	-1.1	0.077941	-0.009243	-0.004298	0.000289	-0.000651	0.000181	0.0001584	0.0034826	0.401	0.829	
4.	2.0	5.0	0.9	0.065253	-0.008990	-0.003287	0.000101	-0.000716	-0.000538	-0.0005005	0.0028421	0.402	0.829	
5.	0.0	5.0	2.9	0.050752	-0.007822	-0.002481	0.000152	-0.000432	-0.000617	-0.0005503	0.0024275	0.401	0.828	-.4
6.	-2.0	5.0	4.4	0.034677	-0.006290	-0.001983	0.000112	-0.000537	-0.000302	-0.0003045	0.0021379	0.400	0.829	-.5
7.	-2.0	7.0	5.9	0.048515	-0.009527	-0.002722	0.000051	-0.000433	-0.001271	-0.0011591	0.0025112	0.401	0.828	-.6
8.	0.0	7.0	4.2	0.063026	-0.011335	-0.003502	-0.000030	-0.000528	-0.001575	-0.0014301	0.0028616	0.401	0.828	-.7
9.	2.0	0.0	-2.5	0.035811	-0.002685	-0.001246	0.000114	-0.000282	0.001021	0.0009319	0.0019232	0.399	0.831	
10.	4.0	0.0	-4.1	0.051287	-0.002630	-0.001867	0.000065	-0.000674	0.001428	0.0012754	0.0021603	0.400	0.830	
11.	6.0	0.0	-6.3	0.064734	-0.002315	-0.002533	0.000083	-0.000674	0.002136	0.0019315	0.0025932	0.400	0.830	-.2
12.	8.0	0.0	-8.4	0.075657	-0.001243	-0.003039	0.000081	-0.000558	0.003502	0.0031032	0.0032394	0.400	0.829	.0
13.	8.0	-5.0	-11.5	0.049971	0.002350	-0.000919	-0.000482	-0.000294	0.003661	0.0032982	0.0021984	0.401	0.830	.1
14.	10.0	-5.0	-13.2	0.062628	0.003936	-0.001376	-0.000705	-0.000621	0.005033	0.0044486	0.0026255	0.400	0.831	.1
15.	10.0	-15.0	-20.2	0.008687	-0.000341	0.000168	-0.000655	-0.000713	0.002348	0.0021498	0.0022819	0.401	0.831	.6
16.	12.0	-15.0	-21.6	0.021605	0.003585	0.000024	-0.001091	-0.000382	0.004031	0.0036863	0.0022194	0.401	0.830	.7
17.	13.7	-15.0	-23.3	0.036263	0.007933	-0.000192	-0.001663	-0.000492	0.006273	0.0055607	0.0022912	0.402	0.830	.6
18.	12.0	-10.0	-18.3	0.048055	0.007067	-0.000307	-0.001163	-0.000443	0.005929	0.0052535	0.0022694	0.402	0.829	.4
19.	10.0	-10.0	-16.6	0.035311	0.004415	-0.000027	-0.000822	-0.000218	0.004347	0.0038960	0.0020523	0.400	0.830	.5
20.	8.0	-10.0	-15.0	0.022223	0.001870	0.000061	-0.000587	-0.000225	0.003032	0.0027113	0.0019328	0.400	0.829	.6
21.	4.0	-5.0	-7.7	0.018561	-0.000366	-0.000299	-0.000149	-0.000012	0.001837	0.0016420	0.0017676	0.402	0.830	.3

Table I – 15. Rotor No. 2.

TEST 31[illegible] RUN 8

44 FT. TAPERED TIP ROTOR V/CR = .41 M(1.0)(90) = .91

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	8.	-3.2	-11.4	.[illegible]	[illegible]	[illegible]	[illegible]	-0.001659	0.004168	0.0041631	0.0033364	0.417	0.928	.3
2.	1[illegible]	-5.[illegible]	-13.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.005612	0.0055777	0.0039782	0.408	0.939	.2
3.	12.[illegible]	-5.[illegible]	-14.7	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0047169	0.408	0.938	.0
4.	6.[illegible]	-5.	-9.4	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0028259	0.407	0.937	.4
5.	4.	-5.	-7.4	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0026356	0.412	0.938	.3
6.	4.[illegible]	[illegible]	-4.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.001653	[illegible]	0.0031442	0.411	0.938	.0
7.	6.[illegible]	[illegible]	-6.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0039800	0.414	0.934	.1
8.	8.	[illegible]	-8.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.004196	[illegible]	0.0048772	0.413	0.934	
9.	1[illegible]	[illegible]	-1[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.410	0.939	
10.	2.[illegible]	[illegible]	-2.2	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0028022	0.408	0.940	
11.	[illegible]	[illegible]	-[illegible].5	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.407	0.945	.1
12.	[illegible]	5.	3.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.408	0.946	-.2
13.	2.	5.[illegible]	1.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.409	0.944	-.4
14.	4.	5.[illegible]	-1.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.407	0.946	
15.	6.[illegible]	5.[illegible]	-3.3	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.407	0.948	
16.	8.[illegible]	5.[illegible]	-5.2	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.400	0.947	
17.	2.[illegible]	7.	2.2	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0.000919	-0.0007020	0.0052983	0.417	0.930	-.5

TEST 31[illegible] RUN 9

44 FT. TAPERED TIP ROTOR V/CR = M(1.0)(9[illegible]) =

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	[illegible]	7.[illegible]	4.2	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0.001447	[illegible]	0.0037970	0.413	0.938	
2.	-2.[illegible]	7.	[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0035740	0.411	0.939	
3.	2.	7.[illegible]	2.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0047063	0.410	0.941	
4.	4.	7.[illegible]	[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0057822	0.411	0.941	
5.	[illegible]	-1[illegible]	-14.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0033277	[illegible]	0.941	.6
6.	1[illegible]	-1[illegible]	-16.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0030520	0.410	0.941	.8
7.	12.	-1[illegible]	-17.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0034884	0.411	0.940	.5
8.	13.7	-1[illegible]	-18.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0041706	0.412	0.938	.5
9.	13.7	-1[illegible]	-22.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0035937	0.413	0.937	.8
10.	12.	-1[illegible]	-21.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0035744	0.413	0.936	.9
11.	1[illegible]	-1[illegible]	-19.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0032724	0.413	0.936	1.0

Table I - 16. Rotor No. 2.

TEST 319.3 RUN 7

44 FT. TAPERED TIP ROTOR V/CR = .45 M(1.0)(90) = .77

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_B}
1.	8.	-5.	-11.4	.042977	0.001221	-0.001187	-0.000255	-0.000189	0.000451	0.0035201	0.0028684	0.448	0.769	.1
2.	6.	-5.	-9.5	.028078	0.000802	-0.000731	-0.000125	-0.000001	0.000429	0.0025258	0.0024721	0.445	0.772	.3
3.	4.	-5.	-7.7	.013605	-0.000148	-0.000437	-0.000138	0.000015	0.000165	0.0017110	0.0021660	0.444	0.771	.2
4.	10.	-5.	-13.4	.055426	0.002568	-0.001658	-0.000347	-0.000231	0.000402	0.0047417	0.0034208	0.447	0.773	.1
5.	12.	-5.	-15.1	.064586	0.003972	-0.002219	-0.000666	-0.000488	0.000605	0.0062827	0.0042697	0.447	0.772	.0
6.	13.7	-5.	-16.7	.073549	0.005947	-0.002296	-0.001626	-0.001323	0.000286	0.0081782	0.0052135	0.447	0.772	.0
7.	12.	-1.	-18.2	.039236	0.004407	-0.001313	-0.000946	-0.000310	0.000281	0.0052070	0.0031542	0.446	0.771	.3
8.	10.	-1.	-16.6	.028748	0.002515	-0.000983	-0.000793	-0.000172	0.000936	0.0039253	0.0027639	0.445	0.771	.6
9.	8.	-1.	-15.	.014700	-0.000150	-0.000249	-0.000346	-0.000165	0.000250	0.0024687	0.0024787	0.444	0.771	.6
10.	13.7	-1.	-2..	.052335	0.007295	-0.002713	-0.001450	-0.000838	0.000213	0.0071807	0.0037747	0.446	0.770	.2
11.	14.	-15.	-23.2	.025387	0.003815	-0.000584	-0.000561	-0.000431	0.000476	0.0059871	0.0033365	0.449	0.772	.7
12.	13.7	-15.	-21.7	.014591	0.000863	-0.000697	-0.000961	-0.000394	0.000127	0.0032820	0.0028876	0.443	0.771	.8
13.	10.	-15.	-2..	.002191	-0.002842	0.000713	-0.000596	-0.000844	0.000436	0.0015904	0.0028616	0.447	0.771	.8
14.	6.	-.	-6.3	.057434	-0.002692	-0.002387	-0.000214	-0.000322	0.000861	0.0019756	0.0029533	0.448	0.770	
15.	8.	-.	-8.4	.068457	-0.002335	-0.002745	-0.000145	-0.000264	0.000227	0.0031285	0.0039098	0.448	0.770	
16.	10.	-.	-10.3	.078456	-0.000627	-0.003958	0.000119	-0.000461	0.000063	0.0051379	0.0050691	0.447	0.772	
17.	4.	-.	-4.3	.043844	-0.002716	-0.001715	-0.000167	-0.000104	0.000256	0.0014003	0.0025030	0.446	0.770	.1
18.	2.	-.	-2.2	.028589	-0.002693	-0.001189	0.000375	-0.000268	0.000914	0.0010839	0.0022387	0.446	0.769	
19.	11.	-.	-11.2	.082471	0.000197	-0.004163	0.000223	-0.001780	0.000658	0.0060661	0.0055945	0.444	0.768	
20.	2.	5.	1.	.006142	-0.009159	-0.003272	0.000211	-0.000885	-0.000685	-0.0006993	0.0031625	0.445	0.770	
21.	-2.	5.	2.8	.047992	-0.008195	-0.002523	0.000215	-0.000635	-0.000791	-0.0006384	0.0029101	0.449	0.770	
22.	-2.	5.	4.	.033195	-0.006723	-0.001903	0.000155	-0.000436	-0.000409	-0.0002553	0.0026981	0.449	0.770	-.4
23.	4.	5.	-1.5	.073613	-0.009448	-0.004124	0.000261	-0.000806	-0.000490	0.0000638	0.0039916	0.448	0.770	-.5
24.	6.	5.	-3.5	.063196	-0.008971	-0.004875	0.000355	-0.001497	0.001462	0.0015349	0.0051759	0.449	0.770	.0
25.	8.	5.	-5.5	.091.97	-0.007339	-0.005514	0.000514	-0.001247	0.000479	0.0036047	0.0064158	0.447	0.773	-.8
26.	10.	5.	-7..	.1 347	-0.006524	-0.005351	0.000621	-0.001389	0.000673	0.0056914	0.0080356	0.447	0.773	.4
27.	..	7.	4.	.062952	-0.012275	-0.003571	-0.000203	-0.001096	-0.000837	-0.0017735	0.0034745	0.446	0.772	-.5
28.	-2.	7.	6.	.047245	-0.011323	-0.002706	-0.000151	-0.000777	-0.000748	-0.0013959	0.0030814	0.446	0.771	.0
29.	2.	7.	2.	.076143	-0.013271	-0.004339	-0.000113	-0.001167	-0.000566	-0.0014593	0.0041732	0.446	0.771	-.7

Table I - 17. Rotor No. 2.

TEST 310.0 RUN 12

44 FT. TAPERED TIP ROTOR V/OR = .46 M(1.0)(90) = .86

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-5.0	-12.0	0.042112	0.000632	-0.000775	-0.000409	-0.000512	0.003547	0.0035693	0.0031800	0.462	0.865	.4
2.	10.0	-5.0	-14.0	0.055047	0.001821	-0.001248	-0.000510	-0.001084	0.004943	0.0049690	0.0039595	0.464	0.862	.4
3.	12.0	-5.0	-15.6	0.064233	0.003308	-0.001719	-0.000655	-0.001216	0.006596	0.0066279	0.0048700	0.463	0.864	.3
4.	6.0	-5.0	-10.0	0.030752	-0.000370	-0.000552	-0.000325	-0.000427	0.002606	0.0026246	0.0027439	0.462	0.865	.4
5.	4.0	-5.0	-7.7	0.017345	-0.001358	-0.000264	-0.000241	-0.000429	0.001827	0.0018407	0.0024554	0.465	0.863	.4
6.	2.0	-5.0	-6.2	0.001750	-0.002306	-0.000004	-0.000168	-0.000092	0.001216	0.0012260	0.0022907	0.462	0.866	.2
7.	4.0	0.0	-4.5	0.048240	-0.003354	-0.001811	-0.000018	-0.000487	0.001433	0.0014333	0.0028566	0.462	0.865	
8.	6.0	0.0	-6.8	0.060819	-0.003221	-0.002618	0.000078	-0.000973	0.002186	0.0021862	0.0034834	0.465	0.861	
9.	8.0	0.0	-8.9	0.071453	-0.002525	-0.003268	0.000078	-0.000856	0.003611	0.0036113	0.0045046	0.464	0.862	
10.	10.0	0.0	-10.9	0.078060	-0.001221	-0.003679	0.000024	-0.001342	0.005454	0.0054543	0.0056902	0.465	0.864	
11.	2.0	0.0	-2.6	0.033921	-0.003243	-0.001368	0.000040	-0.000737	0.001049	0.0010490	0.0024960	0.466	0.864	
12.	0.0	0.0	-0.8	0.020528	-0.003110	-0.000742	-0.000055	-0.000643	0.000901	0.0009013	0.0023275	0.466	0.863	
13.	-2.0	0.0	0.5	0.006242	-0.002703	-0.000535	0.000070	-0.000366	0.001048	0.0010477	0.0023029	0.465	0.862	
14.	0.0	2.0	0.5	0.034769	-0.004748	-0.001552	0.000054	-0.000597	0.000400	0.0004019	0.0025496	0.466	0.861	
15.	-2.0	2.0	2.0	0.019580	-0.003850	-0.000923	0.000125	-0.000586	0.000637	0.0006415	0.0024077	0.464	0.864	
16.	2.0	2.0	-1.5	0.048690	-0.005373	-0.002278	0.000144	-0.000717	0.000470	0.0004749	0.0028610	0.468	0.858	
17.	4.0	2.0	-3.7	0.061234	-0.005628	-0.002973	0.000234	-0.000992	0.000918	0.0009259	0.0033336	0.464	0.864	
18.	4.0	5.0	-1.8	0.079080	-0.009620	-0.004812	0.000315	-0.000831	0.000423	0.0004489	0.0046117	0.468	0.857	
19.	6.0	5.0	-4.0	0.086294	-0.008614	-0.005320	0.000550	-0.000985	0.002002	0.0020426	0.0056678	0.468	0.857	
20.	2.0	5.0	0.3	0.066916	-0.009601	-0.003912	0.000179	-0.000900	-0.000588	-0.0005697	0.0036768	0.468	0.856	
21.	0.0	5.0	2.1	0.054723	-0.008751	-0.003071	0.000083	-0.000622	-0.000806	-0.0007952	0.0031401	0.468	0.856	
22.	-2.0	5.0	4.0	0.039578	-0.007233	-0.002374	0.000106	-0.000559	-0.000519	-0.0005083	0.0027835	0.467	0.862	
23.	10.0	-10.0	-16.8	0.027762	0.001798	-0.000005	-0.000738	-0.000466	0.004120	0.0041852	0.0033086	0.464	0.864	.8
24.	8.0	-10.0	-15.3	0.014579	-0.000450	0.000120	-0.000599	-0.000362	0.002723	0.0027858	0.0029826	0.463	0.863	.7
25.	6.0	-10.0	-12.9	0.002109	-0.002465	0.000143	-0.000310	-0.000239	0.001524	0.0015549	0.0026931	0.462	0.864	.7
26.	12.0	-10.0	-18.3	0.039514	0.003995	-0.000296	-0.000731	-0.000583	0.005620	0.0056620	0.0037220	0.464	0.863	.8
27.	13.7	-10.0	-20.3	0.050493	0.006411	-0.000692	-0.001307	-0.000705	0.007347	0.0074625	0.0043477	0.464	0.863	.7
28.	13.7	-12.0	-21.5	0.039784	0.005450	-0.000384	-0.001353	-0.000580	0.006617	0.0067538	0.0041380	0.464	0.863	.9
29.	12.0	-12.0	-20.0	0.028883	0.002723	-0.000203	-0.000900	-0.000897	0.004998	0.0050761	0.0037710	0.463	0.864	.9
30.	10.0	-12.0	-18.3	0.016342	0.000193	-0.000020	-0.000687	-0.000260	0.003369	0.0034378	0.0033340	0.463	0.863	.9
31.	13.7	-15.0	-23.3	0.024399	0.002945	0.000090	-0.001421	-0.000722	0.005133	0.0053257	0.0039278	0.464	0.864	.9
32.	12.0	-15.0	-21.9	0.012386	-0.000433	0.000139	-0.000870	-0.000472	0.003232	0.0033469	0.0035397	0.464	0.862	1.1
33.	10.0	-15.0	-20.4	0.000799	-0.003389	-0.000034	-0.000384	-0.000530	0.001681	0.0017230	0.0032886	0.462	0.868	1.0

Table I - 18. Rotor No. 2.

TEST 310.0 RUN 11

44 FT. TAPERED TIP ROTOR V/OR = .45 M(1.0)(90) = .90

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.9	0.030915	-0.000277	-0.000785	-0.000140	-0.000622	0.002660	0.0026625	0.0027315	0.445	0.900	.3
2.	8.0	-5.0	-11.9	0.045028	0.000870	-0.001154	-0.000266	-0.000894	0.003698	0.0037076	0.0032047	0.445	0.901	.4
3.	10.0	-5.0	-13.9	0.057773	0.002382	-0.001619	-0.000533	-0.000992	0.005229	0.0052551	0.0040013	0.447	0.897	.2
4.	12.0	-5.0	-15.5	0.066193	0.003740	-0.002060	-0.000575	-0.001229	0.006724	0.0067484	0.0048325	0.446	0.899	.3
5.	13.0	-5.0	-16.4	0.068578	0.005170	-0.002315	-0.000673	-0.001003	0.007508	0.0075383	0.0049439	0.451	0.906	.1
6.	13.0	-5.0	-16.4	0.068780	0.004408	-0.002277	-0.000691	-0.001153	0.007515	0.0075462	0.0053269	0.442	0.900	.1
7.	4.0	-5.0	-7.9	0.017890	-0.001385	-0.000538	-0.000222	-0.000512	0.001837	0.0018497	0.0024400	0.439	0.900	.3
8.	2.0	-5.0	-6.0	0.003947	-0.002349	-0.000392	-0.000041	-0.000435	0.001251	0.0012496	0.0022807	0.439	0.898	.2
9.	2.0	0.0	-2.6	0.033034	-0.003844	-0.001544	0.000090	-0.001046	0.001098	0.0010981	0.0027372	0.443	0.898	.1
10.	4.0	0.0	-4.6	0.048232	-0.003731	-0.002289	0.000234	-0.000822	0.001493	0.0014929	0.0030181	0.444	0.900	
11.	6.0	0.0	-6.6	0.061392	-0.003614	-0.002827	0.000073	-0.000961	0.002386	0.0023863	0.0037850	0.446	0.898	
12.	8.0	0.0	-8.8	0.070868	-0.002786	-0.003527	0.000142	-0.001227	0.003811	0.0038110	0.0047665	0.445	0.897	
13.	10.0	0.0	-10.8	0.078276	-0.001353	-0.003850	0.000028	-0.002037	0.005775	0.0057746	0.0060310	0.446	0.896	
14.	0.0	0.0	-0.9	0.019831	-0.003758	-0.001036	0.000120	-0.000854	0.000970	0.0009703	0.0026184	0.445	0.899	.1
15.	-2.0	0.0	0.6	0.005797	-0.003457	-0.000656	0.092029	-0.000729	0.001080	0.0010803	0.0026221	0.447	0.895	.1
16.	2.0	2.0	-1.4	0.049390	-0.006664	-0.002192	0.000121	-0.001323	0.000478	0.0004817	0.0033093	0.445	0.895	
17.	4.0	2.0	-3.6	0.062949	-0.006718	-0.003137	0.000224	-0.001308	0.001028	0.0010352	0.0037998	0.445	0.896	
18.	0.0	2.0	0.5	0.034283	-0.005984	-0.001636	0.000042	-0.001262	0.000485	0.0004865	0.0030953	0.447	0.894	
19.	-2.0	2.0	2.1	0.015937	-0.005252	-0.001216	-0.000710	-0.004135	0.000634	0.0006085	0.0029382	0.446	0.895	
20.	-2.0	5.0	4.1	0.042758	-0.009036	-0.002332	0.000146	-0.001570	-0.000595	-0.0005797	0.0033647	0.448	0.895	
21.	0.0	5.0	2.4	0.047327	-0.010316	-0.003152	0.000071	-0.003754	-0.000770	-0.0007607	0.0037393	0.448	0.894	
22.	2.0	5.0	0.5	0.069948	-0.011536	-0.003867	0.000096	-0.001839	-0.000577	-0.0005667	0.0043149	0.447	0.893	
23.	4.0	5.0	-1.7	0.081038	-0.011081	-0.004826	0.000378	-0.001671	0.000510	0.0005406	0.0051259	0.447	0.894	
24.	8.0	-10.0	-15.1	0.017404	0.000041	0.000140	-0.000506	-0.000259	0.002874	0.0029178	0.0028822	0.450	0.893	.6
25.	6.0	-10.0	-13.2	0.004177	-0.002296	0.000035	-0.000257	-0.000510	0.001631	0.0016512	0.0026805	0.449	0.892	.6
26.	10.0	-10.0	-16.8	0.031380	0.002419	-0.000009	-0.000837	-0.000594	0.004374	0.0044527	0.0033154	0.447	0.895	
27.	12.0	-10.0	-18.5	0.043406	0.004764	-0.000195	-0.001011	-0.000768	0.005873	0.0059597	0.0037296	0.446	0.899	.8
28.	13.7	-10.0	-20.3	0.047177	0.007281	-0.000478	-0.002452	-0.002625	0.007614	0.0079245	0.0045279	0.449	0.896	.5
29.	13.7	-12.0	-21.4	0.040569	0.005532	-0.000340	-0.001357	0.000287	0.007029	0.0071578	0.0046045	0.445	0.897	.8
30.	12.0	-12.0	-19.8	0.032481	0.003865	-0.000079	-0.001247	-0.000466	0.005262	0.0054065	0.0036095	0.450	0.887	.7
31.	10.0	-12.0	-18.0	0.021134	0.001315	0.000222	-0.000802	-0.000745	0.003684	0.0037706	0.0031525	0.451	0.888	.9
32.	13.7	-15.0	-23.2	0.029179	0.004589	0.000588	-0.001734	-0.001043	0.005508	0.0057694	0.0036791	0.445	0.897	1.0
33.	12.0	-15.0	-21.7	0.017472	0.001315	0.000666	-0.001386	-0.000756	0.003760	0.0039904	0.0033791	0.452	0.887	1.0
34.	10.0	-15.0	-20.1	0.004897	-0.002100	0.000561	-0.001582	-0.000729	0.002008	0.0023486	0.0032939	0.451	0.886	.9

Table I - 19. Rotor No. 2.

TEST 31[illegible] RUN 1

44 FT. TAPERED TIP ROTOR V/CR = .51 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	6.[illegible]	-5.[illegible]	-9.6	[illegible]22667	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.002409	0.0024008	0.0034135	0.514	0.805	.4
2.	6.4	[illegible]	-6.8	[illegible]052423	-0.004565	-[illegible]2712	[illegible]	-[illegible]1374	0.002079	0.0020787	0.0043092	0.518	0.802	.1
3.	8.[illegible]	[illegible]	-9.[illegible]	[illegible]062578	-[illegible]	-[illegible]3698	[illegible]	-[illegible]1068	0.003304	[illegible].0033042	0.0052291	0.519	0.802	.0
4.	4.[illegible]	[illegible]	-4.9	[illegible].038421	-[illegible]4191	-[illegible]1809	-[illegible]1078	-[illegible]1078	0.001393	0.0013932	0.0034628	0.511	0.809	.2
5.	2.[illegible]	[illegible]	-2.8	[illegible].025717	-[illegible]3992	-[illegible]2232	[illegible]1218	-[illegible]1[illegible]40	0.000698	[illegible].0006978	0.0027096	0.512	0.808	.1
6.	2.[illegible]	5.[illegible]	[illegible].2	[illegible].63394	-[illegible]1822	-[illegible]3824	[illegible]0273	-[illegible]2681	-0.000572	-[illegible].0005522	0.0048861	0.521	0.799	
7.	[illegible].[illegible]	5.[illegible]	2.1	[illegible].051865	-0.[illegible]9857	-[illegible].002415	-[illegible]0931	-[illegible].001806	-0.000868	-[illegible].0009431	0.0040640	0.521	0.799	
8.	-2.[illegible]	5.[illegible]	4.1	[illegible].039291	-[illegible].[illegible]8956	-[illegible].001981	-[illegible]0774	-[illegible].0[illegible]2073	-0.000721	-[illegible].0007247	0.0037819	0.512	0.809	
9.	8.[illegible]	-5.[illegible]	-11.8	[illegible].034465	-[illegible].[illegible]1424	-[illegible].[illegible]1367	-[illegible]0[illegible]33	-[illegible].[illegible]1366	0.[illegible]3326	[illegible].0033167	0.0039870	0.512	0.808	.6
10.	1[illegible].[illegible]	-5.[illegible]	-13.7	[illegible].045155	-[illegible].[illegible]521	-[illegible].[illegible]1683	-[illegible].[illegible]322	-[illegible].[illegible]1601	[illegible].[illegible]4409	[illegible].0044203	[illegible].0045834	0.508	0.811	.5
11.	1[illegible].[illegible]	-1[illegible].[illegible]	-16.8	[illegible].018796	-[illegible].[illegible]1[illegible]34	-[illegible].[illegible]1526	-[illegible].[illegible]1347	-[illegible].[illegible]1[illegible]688	0.[illegible]3547	[illegible].0035537	[illegible].0040631	0.509	0.810	.8
12.	12.[illegible]	-1[illegible].[illegible]	-18.5	[illegible].02977[illegible]	[illegible].[illegible]3892	-[illegible].[illegible]1625	-[illegible].[illegible]1[illegible]44	-[illegible].[illegible]1[illegible]750	0.[illegible]4935	[illegible].0[illegible]5413	[illegible].0045432	0.509	0.812	.9
13.	13.7	-1[illegible].[illegible]	-2[illegible].4	[illegible].[illegible]39634	[illegible].[illegible]2499	-[illegible].[illegible]1828	-[illegible].[illegible]3695	-[illegible].[illegible]1959	[illegible].[illegible]6449	[illegible].0064716	[illegible].0051189	0.510	0.809	.7
14.	13.7	-12.[illegible]	-21.5	[illegible].029564	[illegible].[illegible]1489	-[illegible].[illegible]2[illegible]8	-[illegible].[illegible]1361	-[illegible].[illegible]0734	[illegible].[illegible]5536	[illegible].0056983	[illegible].0048936	0.512	0.810	.9
15.	12.[illegible]	-8.[illegible]	-17.4	[illegible].[illegible]4251	[illegible].[illegible]1331	-[illegible].[illegible]1975	-[illegible].[illegible]1978	-[illegible].[illegible]1123	[illegible].[illegible]5371	[illegible].0[illegible]54686	[illegible].0047075	0.512	0.809	.8
16.	1[illegible].[illegible]	-8.[illegible]	-15.7	[illegible].[illegible]3722	-[illegible].[illegible]1131	-[illegible].[illegible]1931	-[illegible].[illegible]1248	-[illegible].[illegible]0745	[illegible].[illegible]4061	[illegible].0040563	[illegible].0040254	0.510	0.808	.8
17.	8.[illegible]	-8.[illegible]	-13.[illegible]	[illegible].[illegible]17[illegible].3	-[illegible].[illegible]1686	-[illegible].[illegible]1[illegible]72[illegible]	-[illegible].[illegible]56	-[illegible].[illegible]0711	[illegible].[illegible]2838	[illegible].0027892	[illegible].0036351	0.510	0.808	.8
18.	8.[illegible]	-3.[illegible]	-1[illegible].8	[illegible].045488	-[illegible].[illegible]2271	-[illegible].[illegible]2226[illegible]	-[illegible].[illegible]1[illegible]13[illegible]	-[illegible].[illegible]1549	[illegible].[illegible]3418	[illegible].0034198	[illegible].0044805	0.512	0.809	.6
19.	6.[illegible]	-3.[illegible]	-8.8	[illegible].033[illegible]09	-[illegible].[illegible]2384	-[illegible].[illegible]1793	[illegible].[illegible]0227	-[illegible].[illegible]1625	[illegible].[illegible]2457	[illegible].0024422	0.0036042	0.510	0.810	.5
20.	4.[illegible]	-3.[illegible]	-6.o	[illegible].[illegible]22859	-[illegible].[illegible]2774	-[illegible].[illegible]1762	[illegible].[illegible]0423	-[illegible].[illegible]0729	[illegible].[illegible]1865	[illegible].0018396	[illegible].0032283	0.510	0.810	.4
21.	4.[illegible]	[illegible].[illegible]	-3.7	[illegible].[illegible]53653	-[illegible].[illegible]64 9	-[illegible].[illegible]1368	-[illegible].[illegible]1943	-[illegible].[illegible]1497	[illegible].[illegible]2152	[illegible].002[illegible]807	[illegible].0052496	0.516	0.811	
22.	2.[illegible]	2.[illegible]	-1.6	[illegible].[illegible]43328	-[illegible].[illegible]6145	-[illegible].[illegible]2174	[illegible].[illegible]27	-[illegible].[illegible]1007	0.[illegible]0549	0.0025495	0.0036067	0.512	0.808	
23.	6.[illegible]	[illegible].[illegible]	-5.8	[illegible].[illegible]69472	-[illegible].[illegible]6759	-[illegible].[illegible]3538	[illegible].[illegible]3[illegible]5	-[illegible].[illegible]1869	0.[illegible]1848	0.0018577	[illegible].0050986	0.511	0.810	

Table I - 19. Rotor No. 2.

TEST 310.0 RUN 1

44 FT. TAPERED TIP ROTOR V/CR = .51 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.1	-9.6	0.022667	-0.002019	-0.001046	-0.000015	-0.000537	0.002409	0.0024008	0.0034135	0.514	0.805	.4
2.	6.0	-1.1	-6.8	0.052429	-0.004565	-0.002712	0.000218	-0.001374	0.002879	0.0020787	0.0043092	0.518	0.802	.1
3.	8.0	-3.0	-9.0	0.062578	-0.004479	-0.003698	0.000253	-0.001068	0.003304	0.0033042	0.0052291	0.519	0.802	.0
4.	4.0	0.1	-4.9	0.038421	-0.004191	-0.001809	-0.000078	-0.001078	0.001393	0.0013932	0.0034628	0.511	0.809	.2
5.	2.0	0.1	-2.8	0.025717	-0.003992	-0.002232	0.001218	-0.001540	0.000698	0.0006978	0.0027096	0.512	0.808	.1
6.	2.0	5.0	0.2	0.063394	-0.010822	-0.003824	0.000203	-0.002681	-0.000572	-0.0005522	0.0048861	0.521	0.799	
7.	4.0	5.0	2.1	0.051865	-0.009857	-0.002415	-0.000091	-0.001806	-0.000868	-0.0009431	0.0040640	0.521	0.799	
8.	-2.0	5.0	4.1	0.039291	-0.008956	-0.001981	-0.000074	-0.002073	-0.000721	-0.0007247	0.0037819	0.512	0.809	
9.	8.0	-5.0	-11.8	0.084465	-0.011424	-0.001367	-0.000033	-0.001366	0.003326	0.0033167	0.0039870	0.512	0.808	.6
10.	10.0	-5.0	-13.7	0.045155	-0.008521	-0.001683	-0.000322	-0.001601	0.004409	0.0044203	0.0045834	0.508	0.811	.5
11.	10.0	-10.0	-16.8	0.018796	-0.011134	-0.000526	-0.000347	-0.000688	0.003547	0.0035537	0.0040631	0.509	0.810	.8
12.	12.0	-10.0	-18.5	0.029770	-0.010892	-0.000625	-0.000344	-0.000756	0.004935	0.0050413	0.0045432	0.509	0.812	.9
13.	13.7	-10.0	-21.4	0.039634	-0.012499	-0.000828	-0.000695	-0.001959	0.006449	0.0064716	0.0051189	0.510	0.809	.7
14.	13.7	-12.0	-21.5	0.029564	-0.011489	-0.000208	-0.001361	-0.001734	0.005536	0.0056983	0.0048936	0.512	0.810	.9
15.	12.0	-8.0	-17.4	0.024251	-0.011331	-0.001175	-0.001178	-0.001123	0.005371	0.0054686	0.0047075	0.512	0.809	.8
16.	10.0	-8.0	-15.7	0.033722	-0.013031	-0.001931	-0.001248	-0.000745	0.004061	0.0040563	0.0040254	0.510	0.808	.8
17.	8.0	-8.0	-13.0	0.017203	-0.011686	-0.000722	-0.000956	-0.000711	0.002808	0.0027897	0.0036351	0.510	0.808	.8
18.	8.0	-3.0	-10.8	0.045488	-0.012271	-0.002262	-0.000130	-0.001549	0.003418	0.0034198	0.0044805	0.512	0.809	.6
19.	6.0	-3.0	-8.8	0.033019	-0.012384	-0.001793	0.000227	-0.001625	0.002457	0.0024422	0.0036042	0.510	0.810	.5
20.	4.0	-3.0	-6.6	0.022859	-0.012774	-0.001762	0.000433	-0.000729	0.001865	0.0018396	0.0032283	0.510	0.810	.4
21.	4.0	2.0	-3.7	0.053653	-0.016409	-0.001368	-0.001943	-0.001497	0.002152	0.0022837	0.0052496	0.516	0.811	
22.	2.0	2.0	-1.6	0.043028	-0.016145	-0.001217	0.000027	-0.001097	0.001549	0.0015495	0.0036067	0.512	0.808	
23.	6.0	2.0	-5.8	0.069472	-0.016759	-0.003538	0.000395	-0.001869	0.001848	0.0018577	0.0050986	0.511	0.810	

Table I-19. (Concluded)

TEST 310.0 RUN 14

44 FT. TAPERED TIP ROTOR V/OR = .51 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	2.0	-2.0	-4.0	0.015670	-0.002709	-0.000687	-0.000078	-0.000283	0.001275	0.0012825	0.0026617	0.514	0.805	.3
2.	2.0	-2.0	-3.0	0.026319	-0.003368	-0.000901	-0.000069	-0.000609	0.001129	0.0011118	0.0028208	0.517	0.803	.2
3.	2.0	0.0	-1.0	0.048181	-0.006329	-0.001738	-0.000017	-0.001039	0.000157	0.0002447	0.0033858	0.514	0.805	.2
4.	2.0	2.0	1.0	0.076086	-0.012457	-0.002878	0.000059	-0.001250	-0.001070	-0.0009358	0.0052405	0.518	0.799	.2
5.	0.0	0.0	-1.0	0.016944	-0.003288	-0.000729	-0.000041	-0.000148	0.000999	0.0009423	0.0026076	0.511	0.806	.2
6.	0.0	2.0	1.0	0.038727	-0.006067	-0.001637	-0.000120	-0.000629	0.000078	0.0001221	0.0031617	0.513	0.805	.2
7.	0.0	4.0	3.0	0.062579	-0.011672	-0.002527	-0.000223	-0.001235	-0.001653	-0.0014673	0.0043300	0.513	0.805	.2
8.	0.0	6.0	5.0	0.085738	-0.018666	-0.003391	-0.000281	-0.001471	-0.003029	-0.0026958	0.0066611	0.515	0.805	.2
9.	-2.0	6.0	5.0	0.050839	-0.010246	-0.002825	-0.000192	-0.000564	-0.001529	-0.0013806	0.0037603	0.514	0.804	.1
10.	-2.0	4.0	3.0	0.028585	-0.005644	-0.001678	-0.000077	-0.000571	0.000122	0.0001206	0.0029580	0.510	0.809	.1
11.	4.0	0.0	-1.0	0.087023	-0.012557	-0.003416	0.000492	-0.001488	0.000251	0.0003019	0.0063242	0.510	0.808	.1
12.	4.0	-2.0	-3.0	0.066455	-0.007678	-0.002664	0.000053	-0.001630	0.000649	0.0006424	0.0043658	0.513	0.804	.1
13.	4.0	-4.0	-5.0	0.041972	-0.003379	-0.001503	-0.000091	-0.000751	0.001491	0.0013890	0.0030255	0.510	0.808	.1

For the following data points a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	2	-2	0	0
2	2	-2	1.4	0
3	2	0	2.9	0
4	2	2	4.8	0
5	0	0	0	0
6	0	2	1.4	0
7	0	4	2.9	0
8	0	6	4.3	0
9	-2	6	.8	0
10	-2	4	- .7	0
11	4	0	6.7	0
12	4	-2	5.3	0
13	4	-4	3.4	0

Table I - 20. Rotor No. 2.

TEST 310.0 RUN 15

44 FT. TAPERED TIP ROTOR V/OR = .52 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-10.1	0.023890	-0.001968	-0.000595	-0.000408	-0.000715	0.002443	0.0022069	0.0032143	0.526	0.811	-5
2.	8.0	-5.0	-12.0	0.036611	-0.001253	-0.001154	-0.000312	-0.001052	0.003290	0.0029701	0.0035596	0.522	0.814	.5
3.	10.0	-5.0	-14.1	0.047761	-0.000502	-0.001646	-0.000465	-0.001049	0.004600	0.0040518	0.0042038	0.523	0.812	.4
4.	12.0	-5.0	-15.8	0.055655	0.000587	-0.002035	-0.000669	-0.001370	0.005998	0.0053004	0.0048435	0.522	0.812	.4
5.	12.0	-7.0	-17.0	0.046380	0.000987	-0.001258	-0.000707	-0.000993	0.005675	0.0049301	0.0043093	0.524	0.810	.7
6.	12.0	-10.0	-18.6	0.030306	0.000467	-0.000419	-0.000933	-0.000729	0.004777	0.0041751	0.0038868	0.522	0.811	1.0
7.	10.0	-7.0	-15.3	0.037174	0.000003	-0.000904	-0.000544	-0.000655	0.004331	0.0037786	0.0037098	0.521	0.811	.9
8.	8.0	-7.0	-13.3	0.026670	-0.001163	-0.000735	-0.000757	-0.000810	0.003183	0.0028128	0.0033849	0.521	0.810	.8
9.	8.0	0.0	-9.3	0.064825	-0.003386	-0.003196	-0.000070	-0.001430	0.003407	0.0030012	0.0045620	0.521	0.809	.2
10.	6.0	0.0	-7.1	0.055322	-0.004117	-0.002799	-0.000056	-0.001243	0.002016	0.0018455	0.0038420	0.521	0.814	.3
11.	4.0	0.0	-4.9	0.044657	-0.004084	-0.002104	-0.000051	-0.000709	0.001354	0.0012606	0.0033063	0.524	0.809	.2
12.	2.0	0.0	-2.9	0.032504	-0.003744	-0.001441	-0.000026	-0.000600	0.001047	0.0009530	0.0028641	0.524	0.809	.2
13.	2.0	2.0	-1.6	0.046001	-0.005610	-0.002286	0.000028	-0.000686	0.000484	0.0004264	0.0032517	0.522	0.812	.1
14.	0.0	2.0	0.2	0.033584	-0.005049	-0.001713	0.000075	-0.000594	0.000430	0.0003959	0.0029725	0.521	0.811	.1
15.	0.0	5.0	2.0	0.053466	-0.008962	-0.003315	-0.000010	-0.000626	-0.000948	-0.0007831	0.0037155	0.518	0.814	
16.	0.0	7.0	3.2	0.067547	-0.012421	-0.004557	-0.000104	-0.000851	-0.001932	-0.0016774	0.0045585	0.520	0.810	
17.	2.0	5.0	0.2	0.063885	-0.009539	-0.004078	-0.000032	-0.000820	-0.000716	-0.0005722	0.0041648	0.518	0.814	
18.	4.0	5.0	-2.1	0.075076	-0.009704	-0.005293	0.000311	-0.001029	0.000316	0.0002781	0.0050921	0.524	0.807	
19.	4.0	2.0	-3.7	0.055160	-0.005478	-0.003134	-0.000091	-0.000802	0.001007	0.0009034	0.0036444	0.527	0.805	
20.	6.0	2.0	-5.9	0.065907	-0.005580	-0.003932	0.000256	-0.001247	0.001926	0.0017418	0.0044419	0.522	0.810	
21.	6.0	-3.0	-8.8	0.038569	-0.002215	-0.001499	-0.000058	-0.000776	0.002470	0.0021692	0.0032504	0.521	0.809	.4
22.	4.0	-3.0	-6.8	0.025216	-0.004019	-0.134523	0.189577	-0.002960	0.051591	0.0016847	0.0037697	0.526	0.804	.5
23.	8.0	-3.0	-10.9	0.049530	-0.001816	-0.002005	-0.000143	-0.001167	0.003293	0.0029619	0.0037843	0.519	0.813	.5
24.	10.0	-3.0	-12.8	0.056892	-0.001078	-0.002600	-0.000176	-0.001599	0.004672	0.0040871	0.0044885	0.519	0.812	.4

Table I - 21. Rotor No. 3.

TEST 310.0 RUN 19

34 FT. 0012 ROTOR V/OR = .51 M(1.0)(90) = .63

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

RT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-2.0	-9.6	0.046128	-0.002715	-0.002206	-0.000310	0.006463	0.003015	0.0028436	0.0040947	0.511	0.648	.0
2.	10.0	-2.0	-11.6	0.056642	-0.002633	-0.002827	-0.000117	0.006402	0.003963	0.0037217	0.0048651	0.512	0.647	.0
3.	6.0	-2.0	-7.8	0.037260	-0.002936	-0.002568	0.001134	0.006751	0.002707	0.0022558	0.0036767	0.514	0.644	.0
4.	4.0	-2.0	-5.8	0.023637	-0.002850	-0.001259	-0.000291	0.006514	0.001788	0.0017716	0.0031824	0.508	0.643	.0
5.	2.0	-2.0	-3.7	0.012665	-0.003122	-0.000668	0.000766	0.007035	0.001333	0.0013811	0.0029683	0.512	0.644	.4
6.	0.0	-2.0	-2.0	0.000790	-0.003366	-0.000252	-0.000120	0.006589	0.001133	0.0011443	0.0028651	0.511	0.644	.5
7.	0.0	2.0	0.7	0.029335	-0.004668	-0.002350	0.001438	0.006673	0.001103	0.0006763	0.0030295	0.512	0.641	
8.	2.0	2.0	-1.2	0.038099	-0.005268	-0.002182	-0.000029	0.006361	0.000790	0.0006718	0.0032641	0.508	0.642	
9.	4.0	2.0	-3.3	0.048393	-0.005751	-0.003036	0.000347	0.006589	0.001220	0.0010761	0.0038726	0.512	0.641	
10.	6.0	2.0	-5.5	0.058285	-0.006364	-0.003638	0.000243	0.005049	0.001762	0.0016368	0.0046639	0.511	0.640	
11.	8.0	2.0	-7.2	0.068211	-0.006441	-0.004321	0.000155	0.005222	0.002674	0.0024352	0.0056269	0.511	0.640	
12.	10.0	2.0	-9.8	0.078962	-0.006637	-0.005278	0.000468	0.004484	0.004177	0.0037198	0.0067122	0.511	0.639	
13.	10.0	0.0	-10.2	0.068045	-0.004457	-0.003828	-0.000121	0.005080	0.004008	0.0036887	0.0058594	0.509	0.641	
14.	12.0	-2.0	-15.7	0.068407	-0.002004	-0.003666	-0.000338	0.005353	0.005772	0.0051166	0.0058353	0.509	0.641	
15.	12.0	-4.0	-14.6	0.056992	-0.000886	-0.002757	-0.000394	0.005471	0.006433	0.0049261	0.0051658	0.507	0.643	
16.	10.0	-4.0	-12.7	0.044899	-0.001340	-0.002082	-0.000301	0.005905	0.004283	0.0038069	0.0043643	0.512	0.639	
17.	8.0	-4.0	-11.1	0.034428	-0.001771	-0.001515	-0.000294	0.005875	0.003276	0.0029804	0.0038068	0.510	0.641	
18.	6.0	-4.0	-9.1	0.025109	-0.002136	-0.001145	0.000013	0.006067	0.002545	0.0022832	0.0033298	0.509	0.638	
19.	4.0	-4.0	-7.2	0.012107	-0.002654	-0.000585	-0.000395	0.006091	0.001744	0.0017114	0.0030488	0.507	0.639	
20.	6.0	-6.0	-10.9	0.012714	-0.002425	-0.000451	-0.000327	0.005962	0.002109	0.0020298	0.0032499	0.507	0.639	
21.	8.0	-6.0	-12.1	0.025259	-0.001573	-0.000874	-0.000402	0.005629	0.003075	0.0028311	0.0035893	0.508	0.639	
22.	10.0	-6.0	-13.8	0.034121	-0.000881	-0.001108	-0.000448	0.005533	0.004087	0.0037397	0.0041153	0.511	0.638	
23.	12.0	-6.0	-15.8	0.047435	0.000117	-0.001865	-0.000652	0.005280	0.005581	0.0050262	0.0048217	0.510	0.637	
24.	14.0	-6.0	-17.8	0.061678	0.001358	-0.001935	-0.001060	0.005154	0.007227	0.0066486	0.0057088	0.511	0.637	
25.	8.0	0.0	-8.5	0.056982	-0.004081	-0.003142	0.000168	0.005772	0.002922	0.0026991	0.0045754	0.511	0.637	
26.	6.0	0.0	-6.7	0.046701	-0.003978	-0.002521	0.000051	0.006070	0.002210	0.0020543	0.0039432	0.510	0.637	
27.	4.0	0.0	-4.7	0.035182	-0.003859	-0.001962	-0.000196	0.005902	0.001623	0.0014904	0.0033797	0.510	0.637	
28.	2.0	0.0	-2.5	0.026141	-0.003805	-0.001369	-0.000088	0.006094	0.001162	0.0010876	0.0029890	0.510	0.637	
29.	0.0	0.0	-0.5	0.012107	-0.003608	-0.000774	-0.000070	0.006164	0.001023	0.0009986	0.0028209	0.508	0.638	
30.	0.0	4.0	2.0	0.036310	-0.007106	-0.002292	0.000098	0.005563	0.000824	0.0000400	0.0035655	0.508	0.638	
31.	0.0	6.0	3.1	0.046460	-0.009814	-0.003002	-0.000195	0.005651	-0.000824	-0.0006863	0.0042112	0.513	0.637	
32.	2.0	6.0	1.5	0.058647	-0.010736	-0.003858	0.000105	0.006239	-0.000800	-0.0006055	0.0046832	0.513	0.637	
33.	2.0	4.0	0.1	0.047105	-0.007965	-0.002766	-0.000107	0.005517	0.000187	0.0001201	0.0040490	0.511	0.639	
34.	4.0	4.0	-2.1	0.059128	-0.008394	-0.003687	-0.000014	0.006040	0.000628	0.0004412	0.0045126	0.512	0.639	.6
35.	4.0	6.0	-0.9	0.068963	-0.010935	-0.004547	0.000299	0.005817	0.000035	0.0000398	0.0053060	0.510	0.641	.0
36.	6.0	6.0	-2.9	0.080700	-0.011746	-0.005350	0.000193	0.005714	0.000999	0.0008493	0.0064657	0.514	0.637	
37.	6.0	4.0	-4.2	0.070018	-0.008894	-0.004576	0.000119	0.005874	0.001524	0.0013347	0.0055917	0.514	0.637	
38.	6.0	8.0	-1.7	0.092874	-0.015077	-0.006294	0.000569	0.005636	0.000548	0.0005257	0.0077084	0.513	0.637	
39.	4.0	8.0	0.2	0.083009	-0.014777	-0.005358	0.000177	0.005779	-0.000692	-0.0006075	0.0064895	0.510	0.635	
40.	4.0	10.0	1.5	0.095287	-0.018864	-0.006016	0.000059	0.005776	-0.001515	-0.0011745	0.0078669	0.510	0.635	.0

Table I-21. (Concluded)

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = .51 M(1.0)(90) = .63

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	2.0	-4.0	-5.2	0.002667	-0.003105	-0.000724	-0.000249	0.004948	0.001406	0.0012160	0.0027834	0.505	0.621	
37.	4.0	-6.0	-8.6	0.003011	-0.003077	-0.000607	-0.000283	0.004956	0.001504	0.0013768	0.0029309	0.505	0.623	.1
38.	6.0	10.0	-0.5	0.101994	-0.019034	-0.005766	0.000315	0.003558	0.000092	0.0002915	0.0091958	0.503	0.623	0
39.	8.0	8.0	-3.6	0.097067	-0.014866	-0.004902	0.000519	0.004210	0.002034	0.0017908	0.0086799	0.505	0.623	.1
40.	8.0	6.0	-4.8	0.087236	-0.011638	-0.004895	0.000543	0.004307	0.002198	0.0018743	0.0072623	0.505	0.623	0
41.	8.0	4.0	-6.1	0.080157	-0.009377	-0.004952	0.000186	0.004033	0.002365	0.0019577	0.0062838	0.506	0.624	0
42.	10.0	4.0	-7.5	0.087047	-0.008878	-0.004439	0.000536	0.004201	0.003950	0.0033742	0.0073812	0.507	0.624	.2
43.	12.0	0.0	-12.1	0.078739	-0.003302	-0.003746	0.000694	0.003920	0.005844	0.0051221	0.0063816	0.504	0.623	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
39	8	8	0	.7
40	8	6	0	.4
42	10	4	0	.6
43	12	0	0	.6

Table I - 22. Rotor No. 3.

TEST 310.0 RUN 23

34 FT. 0012 ROTOR V/OR = .65 M(1.0)(90) = .54

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CM^Z	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-0.9	0.010147	-0.003985	-0.001162	-0.000035	0.009854	0.001320	0.0011998	0.0044359	0.650	0.540	-1.0
2.	0.0	2.0	-0.0	0.022483	-0.006042	-0.001985	-0.000114	0.010279	0.000875	0.0007986	0.0047150	0.652	0.541	- .7
3.	0.0	4.0	0.9	0.037469	-0.008408	-0.002577	-0.000581	0.010399	0.000067	0.0001331	0.0055556	0.653	0.542	
4.	0.0	6.0	2.0	0.047077	-0.010030	-0.003570	-0.000573	0.010700	-0.000684	-0.0006656	0.0057831	0.654	0.542	-1.4
5.	0.0	7.0	2.4	0.051923	-0.012493	-0.004197	-0.000875	0.007905	-0.001327	-0.0010646	0.0069161	0.650	0.540	-1.4
6.	0.0	8.0	3.0	0.060463	-0.014482	-0.004864	-0.000393	0.007609	-0.002008	-0.0015968	0.0076118	0.649	0.540	
7.	0.0	5.0	1.6	0.040322	-0.009311	-0.003115	-0.000567	0.008926	-0.000149	-0.0002661	0.0059073	0.650	0.541	-1.1
8.	2.0	5.0	-0.6	0.046860	-0.010144	-0.003810	-0.000834	0.008776	0.000049	-0.0001345	0.0063825	0.653	0.539	-1.0
9.	2.0	6.0	-0.2	0.050686	-0.010776	-0.004735	-0.000355	0.008947	-0.000387	-0.0003992	0.0069737	0.650	0.540	-1.0
10.	2.0	7.0	0.1	0.056556	-0.012295	-0.005338	-0.000522	0.008260	-0.000987	-0.0007984	0.0070266	0.650	0.540	-1.1
11.	2.0	8.0	0.6	0.065347	-0.014536	-0.005516	-0.000472	0.007830	-0.001868	-0.0013306	0.0078928	0.649	0.540	
12.	2.0	4.0	-1.4	0.042469	-0.009225	-0.003465	-0.000315	0.008659	0.000429	0.0002661	0.0061742	0.650	0.541	- .8
13.	2.0	2.0	-2.3	0.029816	-0.007067	-0.002813	0.000059	0.008281	0.001001	0.0009315	0.0054820	0.650	0.541	- .7
14.	2.0	0.0	-3.2	0.017574	-0.005761	-0.001695	-0.000500	0.008892	0.001383	0.0013308	0.0050657	0.651	0.541	- .6
15.	2.0	-2.0	-4.2	0.008193	-0.005309	-0.001097	-0.000141	0.008906	0.001407	0.0014637	0.0049089	0.649	0.540	- .5
16.	4.0	-2.0	-6.5	0.014088	-0.005532	-0.001745	-0.000140	0.008630	0.001794	0.0017299	0.0053186	0.650	0.541	- .4
17.	4.0	-4.0	-7.5	0.004067	-0.005402	-0.000847	-0.000604	0.008830	0.001679	0.0016142	0.0051498	0.655	0.539	- .3
18.	4.0	0.0	-5.7	0.024088	-0.006170	-0.002373	-0.000230	0.008981	0.001728	0.0016141	0.0056222	0.654	0.539	- .4
19.	4.0	2.0	-4.5	0.037528	-0.007674	-0.003885	0.000226	0.008861	0.001397	0.0010760	0.0060227	0.654	0.539	- .6
20.	4.0	3.0	-4.1	0.044141	-0.008722	-0.004132	0.000203	0.009377	0.001148	0.0008071	0.0064176	0.654	0.539	- .5
21.	4.0	4.0	-3.6	0.050881	-0.009872	-0.004709	0.000015	0.008952	0.000797	0.0005380	0.0068627	0.654	0.539	- .7
22.	4.0	5.0	-3.1	0.053976	-0.010619	-0.005235	0.000309	0.009715	0.000575	0.0004035	0.0071963	0.653	0.539	- .7
23.	4.0	6.0	-2.5	0.058981	-0.011881	-0.005619	-0.000188	0.009287	0.000207	-0.0001347	0.0074617	0.654	0.538	- .8
24.	4.0	7.0	-2.0	0.066281	-0.014205	-0.006063	-0.000246	0.008318	-0.000446	-0.0006737	0.0083967	0.654	0.538	- .9
25.	4.0	8.0	-1.5	0.071390	-0.015049	-0.006685	0.000326	0.007480	-0.000695	-0.0008084	0.0087688	0.653	0.538	-1.0
26.	6.0	7.0	-3.9	0.072951	-0.014447	-0.006615	-0.000036	0.008697	0.000567	0.0004042	0.0095789	0.654	0.538	- .6
27.	6.0	8.0	-3.5	0.077654	-0.015319	-0.006134	0.000156	0.009455	0.000344	0.0002695	0.0099827	0.654	0.538	
28.	6.0	6.0	-4.5	0.064735	-0.012742	-0.006552	0.000043	0.007916	0.000752	0.0004042	0.0085295	0.654	0.538	- .8
29.	6.0	4.0	-5.6	0.055625	-0.010494	-0.005583	0.000277	0.008272	0.001413	0.0009434	0.0076794	0.657	0.539	
30.	6.0	2.0	-6.6	0.042896	-0.008218	-0.004556	0.000773	0.008431	0.001929	0.0014821	0.0067624	0.654	0.538	
31.	6.0	0.0	-7.6	0.032187	-0.006727	-0.003426	0.000350	0.009060	0.001974	0.0018864	0.0062350	0.654	0.538	- .2
32.	6.0	-2.0	-8.7	0.021724	-0.006038	-0.002208	-0.000267	0.009245	0.002103	0.0018864	0.0058111	0.654	0.538	- .2
33.	6.0	-4.0	-9.5	0.008660	-0.005405	-0.001188	-0.000118	0.009395	0.001923	0.0018897	0.0054209	0.654	0.538	.0
34.	8.0	-4.0	-11.6	0.016060	-0.005794	-0.001297	-0.000852	0.009294	0.002450	0.0024297	0.0062082	0.654	0.538	.0
35.	8.0	-6.0	-12.6	0.007398	-0.006192	-0.001012	0.549288	0.009290	0.002172	0.0018898	0.0059403	0.655	0.538	.0

Table I-22. (Concluded)

TEST 310.0 RUN 23

34 FT. 0012 ROTOR V/OR = .65 M(1.0)(90) = .54

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	8.0	-2.0	-10.7	0.027809	-0.006252	-0.002432	-0.000117	0.009607	0.002527	0.0024298	0.0064837	0.655	0.538	.1
37.	8.0	0.0	-9.7	0.037534	-0.006920	-0.003765	0.000290	0.009177	0.002524	0.0022947	0.0067517	0.654	0.538	-.1
38.	8.0	2.0	-8.7	0.049291	-0.008325	-0.004949	0.000818	0.008972	0.002420	0.0020248	0.0073516	0.655	0.538	-.1
39.	8.0	4.0	-7.5	0.061964	-0.010795	-0.005614	0.000437	0.008481	0.002046	0.0017547	0.0085816	0.654	0.538	.0
40.	8.0	6.0	-6.0	0.074285	-0.013998	-0.005741	0.000472	0.007690	0.001984	0.0017548	0.0106362	0.654	0.538	.4
41.	8.0	8.0	-4.0	0.099529	-0.021385	-0.006365	0.000627	0.005711	0.002073	0.0018898	0.0152902	0.655	0.538	.4
42.	10.0	6.0	-6.0	0.102562	-0.021474	-0.006245	0.001195	0.004153	0.004141	0.0036441	0.0171360	0.653	0.538	.0
43.	10.0	4.0	-8.0	0.080400	-0.014919	-0.006284	0.000475	0.005463	0.003596	0.0031164	0.0125999	0.657	0.538	.3
44.	10.0	2.0	-10.0	0.058472	-0.010149	-0.005109	0.000601	0.008090	0.003206	0.0028405	0.0093426	0.657	0.539	.5
45.	10.0	0.0	-11.5	0.044512	-0.008054	-0.004379	0.000749	0.008408	0.003279	0.0029750	0.0081488	0.655	0.538	.1
46.	10.0	-2.0	-12.5	0.035409	-0.007286	-0.003269	-0.000080	0.008604	0.003287	0.0029748	0.0076784	0.654	0.538	.2
47.	10.0	-4.0	-13.5	0.022676	-0.006194	-0.001849	-0.000369	0.009311	0.003040	0.0028399	0.0068734	0.655	0.538	.3
48.	10.0	-6.0	-14.5	0.013116	-0.006206	-0.001178	0.000687	0.009518	0.002735	0.0025695	0.0066298	0.656	0.538	.4
49.	10.0	-8.0	-15.4	0.003851	-0.007262	-0.000367	-0.000466	0.008758	0.002048	0.0018931	0.0066463	0.655	0.538	.4

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
40	8	6	1.0	0
41	8	8	2.9	0
42	10	6	4.8	0
43	10	4	2.9	0
43	10	2	.5	0

Table I - 23. Rotor No. 3.

TEST 310.0 RUN 20

34 FT. 0012 ROTOR V/OR = .75 M(1.0)(90) = .50

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	0.0	-9.5	0.042433	-0.007378	-0.003689	0.000086	0.011269	0.002507	0.0023610	0.0072555	0.675	0.538	
2.	6.0	0.0	-7.6	0.034035	-0.006486	-0.003241	-0.000209	0.011667	0.002138	0.0018053	0.0061226	0.674	0.537	
3.	6.0	0.0	-7.8	0.025665	-0.007874	-0.003312	0.000025	0.012568	0.001803	0.0017341	0.0075900	0.747	0.502	
4.	8.0	0.0	-9.8	0.034513	-0.008471	-0.004429	0.000067	0.016331	0.002815	0.0021107	0.0084432	0.754	0.500	
5.	8.0	-2.0	-11.1	0.021555	-0.008527	-0.002841	0.000155	0.015036	0.001978	0.0021108	0.0085221	0.754	0.500	
6.	10.0	-2.0	-12.9	0.024571	-0.009255	-0.003354	-0.000160	0.016476	0.002424	0.0022908	0.0092434	0.754	0.500	
7.	6.0	-2.0	-9.1	0.013661	-0.007842	-0.001913	-0.000159	0.013371	0.001849	0.0017656	0.0078667	0.756	0.500	
8.	6.0	-4.0	-9.8	0.004121	-0.007621	-0.001079	-0.000449	0.013045	0.001538	0.0015891	0.0073510	0.756	0.500	
9.	8.0	-4.0	-11.9	0.008192	-0.008782	-0.001291	-0.000584	0.013948	0.001841	0.0017658	0.0084123	0.757	0.500	
10.	10.0	-4.0	-13.8	0.012380	-0.009237	-0.001868	-0.000401	0.015318	0.002232	0.0022955	0.0092801	0.757	0.500	
11.	10.0	-6.0	-8.0	-0.004284	-0.006792	-0.000497	-0.000283	0.013878	0.001260	0.0012361	0.0063788	0.757	0.500	
12.	4.0	-2.0	-6.6	0.007763	-0.006507	-0.001258	-0.000476	0.013830	0.001446	0.0015892	0.0065138	0.757	0.500	
13.	2.0	-2.0	-4.1	0.004178	-0.005738	-0.000898	-0.000254	0.014519	0.001277	0.0014126	0.0057555	0.757	0.500	
14.	2.0	0.0	-3.3	0.014783	-0.006337	-0.001688	0.000161	0.014335	0.001389	0.0014128	0.0062075	0.758	0.500	
15.	0.0	0.0	-1.1	0.008686	-0.005992	-0.001049	-0.000159	0.014338	0.001091	0.0012360	0.0057684	0.757	0.500	
16.	0.0	2.0	-0.1	0.022668	-0.006735	-0.002303	0.000005	0.014860	0.001890	0.0008846	0.0059683	0.758	0.500	-1.0
17.	0.0	4.0	0.7	0.026302	-0.008075	-0.003314	-0.000090	0.000545	0.000105	0.0003538	0.0064473	0.758	0.500	-1.3
18.	0.0	6.0	1.9	0.043995	-0.008164	-0.004136	-0.000266	0.017446	-0.000462	-0.0003538	0.0057500	0.758	0.500	-1.4
19.	0.0	8.0	2.4	0.069857	-0.013652	-0.005547	-0.000627	0.017723	-0.002218	-0.0017690	0.0083605	0.757	0.500	-1.4
20.	2.0	8.0	0.5	0.077460	-0.012668	-0.006270	-0.000714	0.020643	-0.002191	-0.0015921	0.0077414	0.757	0.500	-1.4
21.	2.0	6.0	-0.6	0.059174	-0.011942	-0.005508	-0.000033	0.015205	-0.000728	-0.0005307	0.0083648	0.758	0.500	-1.0
22.	2.0	4.0	-1.8	0.044084	-0.007786	-0.004394	-0.000014	0.017847	0.000470	0.0003538	0.0061730	0.758	0.500	-1.0
23.	4.0	4.0	-3.9	0.049453	-0.010625	-0.005402	0.000424	0.013595	0.000891	0.0005307	0.0084834	0.758	0.500	- .8
24.	4.0	2.0	-4.8	0.034527	-0.008925	-0.004611	0.000879	0.012571	0.001287	0.0012384	0.0079558	0.758	0.500	- .5
25.	4.0	0.0	-5.8	0.022084	-0.007645	-0.003065	0.000553	0.012943	0.001502	0.0014153	0.0071924	0.758	0.500	- .4
26.	6.0	2.0	-7.0	0.040999	-0.009735	-0.004883	0.000455	0.012802	0.001598	0.0012719	0.0086843	0.769	0.496	- .3
27.	2.0	2.0	-2.6	0.029932	-0.008096	-0.003177	-0.000174	0.012784	0.001264	0.0008862	0.0069888	0.759	0.500	- .8
28.	4.0	6.0	-3.0	0.061068	-0.012662	-0.006819	0.000566	0.012702	0.000019	0.0000000	0.0094442	0.759	0.500	- .9

Table I - 24. Rotor No. 3.

TEST 310.0 RUN 21

34 FT. 0012 ROTOR V/OR = .86 M(1.0)(90) = .47

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_1
1.	0.0	0.0	-1.1	0.009157	-0.007066	-0.000928	-0.000609	0.019990	0.001227	0.0014035	0.0075418	0.869	0.462	-1.
2.	0.0	2.0	-0.4	0.025285	-0.007946	-0.002131	-0.001057	0.018328	0.000885	0.0011213	0.0078475	0.850	0.467	-1.
3.	0.0	4.0	0.3	0.044369	-0.010758	-0.003270	-0.000794	0.018133	0.000358	0.0004548	0.0095867	0.856	0.465	-1.
4.	0.0	6.0	1.3	0.054647	-0.013275	-0.004359	-0.000654	0.016965	-0.000846	-0.0006728	0.0104929	0.850	0.467	-1.
5.	0.0	8.0	2.0	0.077753	-0.015555	-0.006229	-0.000520	0.020133	-0.002354	-0.0017940	0.0111936	0.850	0.467	-1.
6.	2.0	6.0	-1.0	0.059741	-0.013436	-0.005632	-0.000740	0.018068	-0.000753	-0.0004548	0.0108952	0.855	0.465	-1.
7.	2.0	4.0	-2.1	0.045267	-0.012326	-0.004386	-0.000361	0.016314	0.000170	0.0004557	0.0109444	0.857	0.465	-1.
8.	2.0	2.0	-2.9	0.027029	-0.009406	-0.002906	-0.000627	0.016881	0.001093	0.0009113	0.0089407	0.857	0.465	-1.
9.	2.0	0.0	-3.4	0.013687	-0.007142	-0.001837	-0.000715	0.019224	0.001087	0.0013644	0.0074707	0.856	0.465	-1.
10.	2.0	-2.0	-4.2	-0.002154	-0.007212	-0.000710	-0.000968	0.018179	0.001157	0.0015919	0.0077696	0.857	0.466	- .
11.	4.0	-2.0	-6.6	0.002573	-0.008071	-0.002013	-0.000178	0.018512	0.001372	0.0015918	0.0085009	0.856	0.465	- .
12.	4.0	-4.0	-7.5	-0.013518	-0.008901	0.000086	-0.001055	0.017211	0.000723	0.0011371	0.0087550	0.857	0.466	- .
13.	4.0	0.0	-6.0	0.014054	-0.008878	-0.003038	-0.000111	0.017350	0.001504	0.0015919	0.0091897	0.857	0.466	- .
14.	4.0	2.0	-5.1	0.030507	-0.009361	-0.004190	-0.000304	0.019339	0.001139	0.0011371	0.0091239	0.857	0.466	- .
15.	4.0	4.0	-4.3	0.044482	-0.010418	-0.005873	0.000292	0.019743	0.000550	0.0006822	0.0095164	0.855	0.465	- .
16.	4.0	6.0	-3.4	0.059869	-0.013269	-0.007381	-0.000040	0.019467	-0.000016	0.0000000	0.0112302	0.857	0.466	-1.
17.	4.0	8.0	-2.4	0.087129	-0.016728	-0.008449	-0.000737	0.020044	-0.000731	-0.0006822	0.0133489	0.856	0.465	-1.
18.	6.0	6.0	-5.0	0.074493	-0.016773	-0.009339	0.000586	0.016632	0.000787	0.0009096	0.0150440	0.855	0.465	- .
19.	6.0	4.0	-6.6	0.049443	-0.014345	-0.006794	0.000166	0.015839	0.001338	0.0011370	0.0133230	0.856	0.465	- .
20.	6.0	2.0	-7.5	0.036642	-0.012173	-0.005773	0.000310	0.016996	0.001303	0.0011371	0.0115101	0.856	0.466	- .
21.	6.0	0.0	-8.4	0.016861	-0.010392	-0.003967	0.000220	0.017821	0.001262	0.0015919	0.0104820	0.857	0.466	- .
22.	6.0	-2.0	-9.2	0.001999	-0.010986	-0.002194	-0.000301	0.016006	0.001053	0.0015919	0.0110050	0.857	0.466	
23.	6.0	-4.0	-10.0	-0.012185	-0.011411	-0.000839	-0.000730	0.016735	0.000505	0.0009097	0.0106852	0.857	0.466	
24.	6.0	-6.0	-10.8	-0.042337	-0.012749	0.000001	-0.006094	0.003029	0.000095	0.0002274	0.0110705	0.856	0.465	
25.	8.0	-6.0	-12.7	-0.020121	-0.013683	-0.000182	-0.000842	0.017438	-0.000478	0.0000000	0.0117022	0.856	0.466	
26.	8.0	-4.0	-12.0	-0.010774	-0.012739	-0.000748	-0.000896	0.017636	0.000588	0.0009097	0.0118227	0.857	0.466	
27.	8.0	-2.0	-11.2	0.005842	-0.012090	-0.002571	-0.000297	0.017488	0.001092	0.0013644	0.0117105	0.856	0.465	
28.	8.0	0.0	-10.3	0.017837	-0.011751	-0.003784	-0.000809	0.018193	0.001039	0.0015919	0.0116404	0.856	0.465	
29.	8.0	2.0	-9.7	0.032029	-0.012296	-0.005867	0.000005	0.018325	0.001610	0.0015919	0.0120805	0.856	0.465	
30.	10.0	0.0	-12.1	0.032562	-0.013828	-0.006097	0.000271	0.018403	0.001969	0.0020468	0.0138570	0.857	0.466	.
31.	10.0	-2.0	-13.3	0.010328	-0.013647	-0.003584	-0.000254	0.018052	0.001573	0.0015920	0.0132835	0.857	0.466	.
32.	10.0	-4.0	-14.1	-0.003352	-0.014224	-0.002418	-0.000110	0.017204	0.001268	0.0011371	0.0133263	0.857	0.466	.
33.	10.0	-6.0	-15.0	-0.013660	-0.014925	-0.001386	0.000239	0.018022	-0.000007	0.0004548	0.0132331	0.857	0.466	.
34.	10.0	-8.0	-15.8	-0.024691	-0.016487	-0.000103	-0.000591	0.017118	-0.001364	-0.0008971	0.0131075	0.851	0.467	.

For the following data points a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
18	6	6	1.2	0
30	10	0	1.2	.6

Table I - 25. Rotor No. 3.

TEST 310.0 RUN 22

34 FT. 0012 ROTOR V/OR = .94 M(1.0)(90) = .49

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.4	0.016292	-0.009670	-0.001045	0.004606	0.035292	0.001309	0.0015265	0.0106550	0.945	0.500	-1.4
2.	0.0	2.0	-0.6	0.032574	-0.010043	-0.002956	0.005006	0.036825	0.000949	0.0010966	0.0105714	0.947	0.499	
3.	0.0	4.0	0.2	0.048434	-0.010786	-0.003729	0.004376	0.039295	0.000276	0.0004394	0.0105729	0.947	0.499	-1.8
4.	0.0	6.0	1.1	0.065219	-0.014055	-0.005639	0.005099	0.034809	-0.001133	-0.0006599	0.0123810	0.938	0.496	
5.	2.0	4.0	-2.5	0.046688	-0.010841	-0.005357	0.005620	0.035258	0.000439	0.0006556	0.0107033	0.934	0.496	-1.5
6.	2.0	6.0	-1.4	0.061049	-0.012904	-0.006331	0.005703	0.035255	-0.000439	0.0000000	0.0119237	0.934	0.496	
7.	2.0	8.0	-0.7	0.090781	-0.017473	-0.007170	0.005149	0.035502	-0.002595	-0.0015297	0.0144739	0.933	0.496	-1.8
8.	2.0	2.0	-3.0	0.031664	-0.010052	-0.004002	0.005371	0.034674	0.001117	0.0010989	0.0104735	0.936	0.496	
9.	2.0	0.0	-3.9	0.011960	-0.008421	-0.002032	0.004230	0.035754	0.001351	0.0015657	0.0095133	0.944	0.493	-1.2
10.	2.0	5.0	-1.9	0.051355	-0.011579	-0.005627	0.005474	0.036380	0.000020	0.0004497	0.0112771	0.943	0.492	-1.4
11.	2.0	7.0	-1.2	0.076214	-0.016296	-0.007694	0.006277	0.035118	-0.000947	-0.0006761	0.0146094	0.950	0.493	
12.	4.0	7.0	-3.4	0.076074	-0.017715	-0.009071	0.005690	0.031610	-0.000283	-0.0002257	0.0162916	0.944	0.491	-1.1
13.	4.0	8.0	-3.0	0.086372	-0.017158	-0.007570	0.005631	0.037296	-0.000624	-0.0004516	0.0155919	0.950	0.492	
14.	4.0	6.0	-4.0	0.064593	-0.015600	-0.008583	0.005736	0.034049	-0.000275	0.0000000	0.0146797	0.950	0.492	
15.	4.0	5.0	-4.5	0.050625	-0.012742	-0.007456	0.005772	0.036362	0.000430	0.0004470	0.0123911	0.944	0.494	-1.1
16.	4.0	4.0	-5.0	0.046599	-0.013040	-0.006599	0.005947	0.033738	0.000999	0.0006805	0.0128913	0.942	0.489	-1.1
17.	4.0	2.0	-5.8	0.028182	-0.011534	-0.004876	0.005831	0.032874	0.001186	0.0011342	0.0119801	0.943	0.489	- .9
18.	4.0	0.0	-6.4	0.011544	-0.010247	-0.003813	0.005781	0.032772	0.001215	0.0013637	0.0110375	0.944	0.489	- .6
19.	6.0	0.0	-8.6	0.008460	-0.013235	-0.004009	0.005886	0.031466	0.000893	0.0011363	0.0136210	0.943	0.489	
20.	6.0	2.0	-7.9	0.030758	-0.014543	-0.006390	0.006517	0.031249	0.001047	0.0009107	0.0146009	0.944	0.489	
21.	6.0	4.0	-7.0	0.039885	-0.014295	-0.007371	0.006391	0.033900	0.001454	0.0009106	0.0143426	0.943	0.489	- .4
22.	6.0	5.0	-6.5	0.052430	-0.015486	-0.008258	0.006240	0.033543	0.001081	0.0006830	0.0152159	0.945	0.489	
23.	6.0	6.0	-6.0	0.060495	-0.016417	-0.008561	0.006366	0.033640	0.000989	0.0006830	0.0160568	0.944	0.489	.4
24.	8.0	2.0	-9.9	0.027558	-0.016400	-0.006503	0.006469	0.032069	0.001354	0.0011425	0.0166249	0.946	0.488	.2
25.	8.0	1.0	-10.4	0.017816	-0.016220	-0.005715	0.006583	0.031191	0.001334	0.0011425	0.0164700	0.946	0.488	
26.	8.0	0.0	-10.8	0.009641	-0.016465	-0.004516	0.005866	0.030658	0.000839	0.0011445	0.0167131	0.946	0.488	

Table I - 26. Rotor No. 3.

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = 1.1 M(1.0)(90) = .52

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.011358	-0.007943	-0.001043	-0.000773	0.032879	0.001505	0.0016873	0.0090945	0.933	0.489	-1.3
2.	0.0	0.0	-1.2	0.012140	-0.009380	-0.001286	-0.000491	0.046411	0.001561	0.0016927	0.0110084	0.994	0.505	-1.4
3.	0.0	0.0	-1.2	0.014520	-0.010062	-0.001343	-0.000403	0.057483	0.001564	0.0017077	0.0121070	1.034	0.514	-1.4
4.	0.0	0.0	-1.3	0.018777	-0.011240	-0.001123	-0.001098	0.076990	0.001568	0.0017319	0.0140077	1.093	0.526	-1.5
5.	0.0	0.0	-1.4	0.018883	-0.011155	-0.000991	-0.001193	0.076622	0.001378	0.0017483	0.0139616	1.096	0.524	-1.4
6.	0.0	2.0	-0.6	0.047906	-0.012696	-0.003014	-0.000209	0.075720	0.001512	0.0013017	0.0151879	1.099	0.521	-1.8
7.	0.0	4.0	-0.2	0.069374	-0.015749	-0.004502	-0.001548	0.079923	0.000512	0.0005861	0.0178105	1.103	0.525	-2.0
8.	0.0	6.0	0.5	0.087370	-0.019777	-0.006727	-0.001764	0.077742	-0.000835	-0.0005963	0.0211573	1.111	0.522	-2.3
9.	0.0	6.0	0.6	0.089867	-0.018441	-0.006787	-0.001161	0.074320	-0.001243	-0.0010755	0.0188888	1.096	0.517	-2.2
10.	2.0	6.0	-1.7	0.084591	-0.018434	-0.007993	-0.000847	0.070420	-0.000611	-0.0005982	0.0192796	1.090	0.516	-1.6
11.	2.0	7.0	-1.4	0.099758	-0.022567	-0.008670	-0.000755	0.069761	-0.001661	-0.0013166	0.0230994	1.095	0.517	-1.8
12.	2.0	5.0	-2.3	0.070154	-0.017612	-0.007001	-0.000438	0.070148	0.000462	0.0001197	0.0192018	1.092	0.516	-1.5
13.	2.0	4.0	-2.6	0.059979	-0.015556	-0.006349	0.000226	0.071808	0.000975	0.0006004	0.0175112	1.094	0.516	-1.4
14.	2.0	3.0	-3.1	0.047212	-0.012895	-0.005277	0.000343	0.072380	0.001444	0.0008405	0.0148672	1.093	0.515	-1.2
15.	2.0	2.0	-3.5	0.035843	-0.012671	-0.004838	-0.000072	0.070665	0.001605	0.0013254	0.0151535	1.094	0.515	-1.2
16.	2.0	1.0	-3.7	0.024251	-0.013024	-0.003789	-0.000270	0.068807	0.001760	0.0015691	0.0158153	1.095	0.515	-1.1
17.	2.0	0.0	-4.1	0.013370	-0.012627	-0.003006	-0.000077	0.068954	0.001739	0.0015688	0.0153719	1.094	0.514	-1.1
18.	2.0	-1.0	-4.3	0.004248	-0.012316	-0.002103	-0.001297	0.069510	0.001656	0.0015689	0.0150419	1.094	0.514	
19.	1.0	0.0	-3.0	0.013696	-0.011292	-0.002549	-0.000720	0.068814	0.001671	0.0018131	0.0141458	1.093	0.514	-1.2
20.	1.0	2.0	-2.0	0.042760	-0.012857	-0.004154	0.000015	0.070348	0.001572	0.0013294	0.0153056	1.091	0.513	-1.4
21.	1.0	4.0	-1.4	0.069081	-0.015253	-0.005233	-0.000571	0.071078	0.000756	0.0006043	0.0171052	1.091	0.513	-1.6
22.	1.0	6.0	-0.8	0.088362	-0.018668	-0.007899	-0.000615	0.070838	-0.000851	-0.0008489	0.0193109	1.092	0.513	-1.8
23.	3.0	6.0	-3.2	0.076078	-0.018667	-0.008400	-0.000724	0.069008	-0.000217	-0.0001213	0.0200896	1.092	0.512	-1.3
24.	3.0	7.0	-2.7	0.085803	-0.019579	-0.008884	-0.000912	0.069324	-0.000373	-0.0006074	0.0205761	1.093	0.512	-1.5
25.	4.0	7.0	-3.5	0.092317	-0.022889	-0.009389	-0.000479	0.067476	-0.000467	-0.0003651	0.0244342	1.095	0.512	- .6
26.	4.0	6.0	-4.3	0.069839	-0.018768	-0.008729	-0.000701	0.069936	0.000330	-0.0001219	0.0202955	1.096	0.512	- .7
27.	4.0	4.0	-5.1	0.050287	-0.016977	-0.007666	0.000291	0.069084	0.000791	0.0006095	0.0191405	1.096	0.512	-1.0
28.	4.0	2.0	-6.0	0.033820	-0.014827	-0.005848	-0.001510	0.069234	0.000743	0.0008546	0.0170388	1.094	0.511	- .7
29.	4.0	0.0	-6.7	0.009104	-0.015327	-0.004345	-0.000060	0.067295	0.000912	0.0010988	0.0178618	1.094	0.511	- .6
30.	5.0	0.0	-7.9	0.000770	-0.016904	-0.005155	-0.000346	0.067701	0.000565	0.0008545	0.0193303	1.093	0.511	- .5
31.	6.0	0.0	-8.9	0.001113	-0.018485	-0.005240	-0.000418	0.068165	0.000315	0.0003663	0.0205879	1.094	0.511	- .2
32.	6.0	2.0	-8.3	0.020529	-0.017801	-0.007167	-0.000402	0.066896	0.000746	0.0003669	0.0198306	1.094	0.511	- .5
33.	6.0	1.0	-8.8	0.007938	-0.017515	-0.005828	0.000100	0.067005	0.000648	0.0003674	0.0195144	1.093	0.510	
34.	7.0	0.0	-10.1	-0.000393	-0.019516	-0.005506	-0.000029	0.068122	0.000422	-0.0001225	0.0212060	1.093	0.510	
35.	3.0	0.0	-5.8	0.006914	-0.013469	-0.003994	0.000207	0.066448	0.001608	0.0013497	0.0160974	1.095	0.510	

For the following data point
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
25	4	7	0	.7

Table II - 1. Rotor No. 1, V/OR = .30, M(1.0, 90) = .79

TEST 208.0 RUN 7

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
14.	-5.0	-8.4	0.0051072	-0.001891	-0.001276	0.000317	-0.0010155	0.002782	0.00263220	0.0016538	0.298	0.790	.6	14.
15.	-5.0	-10.0	0.0069751	-0.001947	-0.001618	0.000328	-0.0012229	0.003837	0.0035134	0.0017465	0.300	0.788	.2	16.
16.	-5.0	-11.7	0.0084252	-0.000381	-0.002005	0.000378	0.0000475	0.005105	0.0048717	0.0022472	0.298	0.790	- .1	18.
17.	-10.0	-14.1	0.0041793	-0.001606	-0.000734	0.000246	-0.0001072	0.003703	0.00034549	0.0016240	0.299	0.787	.8	16.
18.	-10.0	-15.4	0.0061085	-0.000997	-0.000829	0.000251	-0.001308	0.005248	0.0049584	0.0017851	0.300	0.786	.6	18.
19.	-10.0	-12.5	0.0024894	-0.001858	-0.000851	0.000289	-0.0000851	0.002489	0.0022614	0.0015147	0.298	0.786	.8	14.
20.	-10.0	-11.0	0.0005328	-0.001777	-0.000783	0.000168	-0.0000559	0.001453	0.00012243	0.0014666	0.297	0.789	.8	12.
21.	-15.0	-18.2	0.0017823	-0.001893	-0.000712	0.000192	-0.0000837	0.002637	0.00023464	0.0015057	0.299	0.788	.7	16.
22.	-15.0	-19.3	0.0034965	-0.001520	-0.000511	0.000275	-0.0001018	0.004303	0.0040008	0.0016396	0.300	0.788	.9	18.
23.	-15.0	-20.9	0.0051578	-0.000917	-0.000577	0.000278	-0.0001020	0.006022	0.0058643	0.0017362	0.300	0.786	.6	20.
24.	-5.0	-6.9	0.0030830	-0.001814	-0.000943	0.000271	-0.0000838	0.002014	0.0018685	0.0015376	0.299	0.788	.7	12.
25.	-5.0	-5.6	0.0012328	-0.001692	-0.000849	0.000205	-0.0000655	0.001486	0.0013534	0.0015223	0.296	0.790	.8	10.
26.	0.0	-1.6	0.0040923	-0.001729	-0.001402	0.000250	-0.0000789	0.001265	0.00111344	0.0015245	0.299	0.788	.8	10.
27.	0.0	-2.8	0.0069284	-0.001814	-0.001919	0.000384	-0.0001146	0.001658	0.0013702	0.0016352	0.297	0.791	.7	12.
28.	0.0	-4.5	0.0090254	-0.001343	-0.002413	0.000440	-0.0001197	0.002139	0.0019386	0.0018645	0.299	0.789	0.0	14.
29.	0.0	-6.4	0.0096102	-0.000070	-0.002997	0.000428	-0.0001402	0.003166	0.0029558	0.0022886	0.299	0.789	- .3	16.
30.	0.0	-0.8	0.0019694	-0.001579	-0.001315	0.000192	-0.0000589	0.001205	0.0010828	0.0015209	0.297	0.792	.7	8.
31.	4.0	3.4	0.0043053	-0.001536	-0.002352	0.000454	-0.0000721	0.000413	0.0003431	0.0015473	0.297	0.791	.2	8.
32.	4.0	1.8	0.0061741	-0.001489	-0.002753	0.000513	-0.0000950	0.000922	0.00082490	0.0016790	0.298	0.789	.1	10.
33.	4.0	0.2	0.0081097	-0.001252	-0.003299	0.000519	-0.0001244	0.000531	0.0004407	0.0019920	0.298	0.789	- .2	12.
34.	4.0	-1.6	0.0096605	-0.000060	-0.003751	0.000632	-0.0001163	0.001210	0.0010647	0.0023855	0.300	0.786	- .5	14.

Table II - 2. Rotor No. 1, V/OR = .30, M(1.0, 90) = .85

TEST 288.0 RUN 3

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.3	0.0029696	-0.001507	-0.001282	0.000558	-0.000934	0.002021	0.0019000	0.0015069	0.302	0.848	1.0	12.
2.	-5.0	-8.7	0.0048985	-0.001387	-0.001518	0.000606	-0.000930	0.002801	0.0026723	0.0016161	0.302	0.848	.7	14.
3.	-5.0	-10.3	0.0057968	-0.000829	-0.001743	0.000598	-0.000915	0.003798	0.0036739	0.0018091	0.301	0.853	.6	16.
4.	-5.0	-12.0	0.0064751	0.000279	-0.001996	0.000519	-0.000919	0.005212	0.0050028	0.0021308	0.304	0.844	.3	18.
5.	-7.0	-13.6	0.0074257	-0.000189	-0.001943	0.000388	-0.000927	0.005294	0.0050733	0.0019787	0.302	0.848	.5	18.
6.	-12.0	-17.2	0.0049238	-0.000826	-0.000819	0.000211	-0.000879	0.004874	0.0046283	0.0018049	0.302	0.848	1.0	18.
7.	-10.0	-15.6	0.0058814	-0.000470	-0.000821	0.000316	-0.000947	0.005076	0.0048216	0.0017258	0.303	0.846	.8	18.
8.	-10.0	-14.6	0.0067489	-0.000049	-0.000599	0.000309	-0.000928	0.005928	0.0056886	0.0018294	0.302	0.848	.8	19.
9.	-8.0	-15.0	0.0075868	0.000535	-0.000899	0.000259	-0.000933	0.005965	0.0057668	0.0019840	0.303	0.847	.6	19.
10.	-6.0	-13.5	0.0066250	0.000948	-0.001652	0.000336	-0.000976	0.006921	0.0067435	0.0021661	0.303	0.846	.3	19.
11.	-7.0	-14.4	0.0081814	0.000568	-0.001227	0.000240	-0.000904	0.005963	0.0058604	0.0020651	0.303	0.846	.5	19.
12.	-7.0	-10.1	0.0037638	-0.001268	-0.000888	0.000389	-0.000519	0.002680	0.0025894	0.0014714	0.303	0.846	.9	14.
13.	-7.0	-8.5	0.0019211	-0.001368	-0.000895	0.000398	-0.000288	0.001848	0.0017432	0.0014205	0.303	0.848	1.1	12.
14.	-7.0	-7.2	0.0001618	-0.001232	-0.000771	0.000208	-0.000508	0.001229	0.0010493	0.0013602	0.303	0.848	.9	10.
15.	-7.0	-7.2	0.0002151	-0.001478	-0.000864	0.000328	-0.000566	0.001230	0.0010714	0.0014367	0.304	0.844	1.0	10.
16.	-3.0	-2.8	0.0003487	-0.001172	-0.001381	0.000398	-0.000568	0.001309	0.0012148	0.0015131	0.303	0.847	1.0	8.
17.	-3.0	-1.4	-0.0015523	-0.000932	-0.001444	0.000376	-0.000534	0.001229	0.0010429	0.0015516	0.302	0.848	.8	6.
18.	-3.0	-8.8	0.0077393	-0.000328	-0.002054	0.000472	-0.000855	0.003670	0.0034991	0.0019128	0.303	0.846	.5	16.
19.	-3.0	-10.6	0.0092799	0.001105	-0.002967	0.000442	-0.000830	0.005032	0.0048308	0.0023621	0.305	0.843	.1	18.
20.	0.0	-6.5	0.0091997	0.000468	-0.003254	0.000647	-0.000624	0.003244	0.0030821	0.0022953	0.303	0.846	.1	16.
21.	0.0	-7.7	0.0096586	0.001739	-0.003494	0.000568	-0.000590	0.004078	0.0038343	0.0025935	0.304	0.845	- .2	17.
22.	0.0	-2.9	0.0056426	-0.001258	-0.002227	0.000669	-0.000822	0.001600	0.0014321	0.0015721	0.304	0.843	.8	12.
23.	3.0	-0.7	0.0073658	-0.000948	-0.003199	0.000856	-0.000813	0.000916	0.0008465	0.0017912	0.304	0.845	.3	12.
24.	3.0	0.8	0.0053896	-0.001218	-0.002717	0.000792	-0.000804	0.000738	0.0006247	0.0016243	0.303	0.847	.7	10.
25.	3.0	2.2	0.0034776	-0.001215	-0.002469	0.000766	-0.000821	0.000811	0.0006969	0.0015270	0.304	0.844	.8	8.
26.	3.0	3.6	0.0016848	-0.001121	-0.002354	0.000735	-0.000812	0.001080	0.0009736	0.0015603	0.305	0.843	.8	6.
27.	3.0	-2.4	0.0089203	0.000259	-0.003860	0.000897	-0.000839	0.001549	0.0013870	0.0021163	0.303	0.846	- .1	14.
28.	3.0	-4.5	0.0099910	0.002430	-0.004146	0.000738	-0.000813	0.003157	0.0029625	0.0030461	0.302	0.848	- .2	15.

Table II - 3. Rotor No. 1, V/OR = .30, M(1.0, 90) = .95

TEST 288.0 RUN 8

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.8	0.049835	-0.002251	-0.001365	0.000386	-0.000400	0.003022	0.0028280	0.0020170	0.297	0.952	.5	14.
2.	-5.0	-6.5	0.031644	-0.002335	-0.001188	0.000470	-0.000411	0.002382	0.0021827	0.0019758	0.300	0.953	.7	12.
3.	-5.0	-9.2	0.067850	-0.002053	-0.001843	0.000441	-0.000422	0.004086	0.0038730	0.0023585	0.300	0.953	.3	16.
4.	-5.0	-10.2	0.075863	-0.001588	-0.002260	0.000517	-0.000431	0.004747	0.0045508	0.0026049	0.300	0.951	.1	17.
5.	-5.0	-10.8	0.084154	-0.000860	-0.002516	0.000651	-0.000503	0.005597	0.0053803	0.0028925	0.300	0.950	0.0	18.
6.	-10.0	-13.3	0.040759	-0.002174	-0.000656	0.000345	-0.000534	0.003781	0.0034776	0.0018744	0.299	0.952	.9	16.
7.	-10.0	-14.8	0.057469	-0.001652	-0.000808	0.000332	-0.000608	0.005327	0.0050772	0.0022950	0.300	0.952	.6	18.
8.	-10.0	-14.1	0.049790	-0.001896	-0.000641	0.000333	-0.000533	0.004586	0.0043715	0.0021451	0.301	0.948	.8	17.
9.	-15.0	-17.6	0.017065	-0.002190	-0.000505	0.000331	-0.000407	0.002778	0.0025684	0.0018567	0.299	0.948	1.1	16.
10.	-15.0	-18.8	0.034121	-0.001986	-0.000349	0.000282	-0.000436	0.004605	0.0041427	0.0019783	0.301	0.948	1.0	18.
11.	-15.0	-19.4	0.042084	-0.001749	-0.000262	0.000273	-0.000455	0.005237	0.0048732	0.0019820	0.300	0.951	1.0	19.
12.	-17.0	-20.6	0.023182	-0.002023	-0.000102	0.000240	-0.000250	0.003608	0.0034500	0.0019624	0.299	0.950	1.2	18.
13.	-17.0	-21.1	0.029754	-0.001779	0.000119	0.000155	-0.000374	0.004324	0.0041537	0.0019900	0.300	0.950	1.1	19.
14.	-17.0	-21.5	0.038427	-0.001640	0.000123	0.000130	-0.000489	0.005291	0.0050920	0.0020825	0.300	0.950	1.0	20.
15.	-17.0	-20.0	0.015258	-0.002078	-0.000381	0.000195	-0.000268	0.002817	0.0026388	0.0018826	0.298	0.949	1.2	17.
16.	-17.0	-19.3	0.007342	-0.002194	-0.000529	0.000397	-0.000280	0.002084	0.0019419	0.0019230	0.298	0.948	1.1	16.

TEST 288.0 RUN 9

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-3.0	-4.1	0.028952	-0.003465	-0.001531	0.000476	0.000361	0.002032	0.0018774	0.0023919	0.298	0.955	.8	11.
2.	-3.0	-3.5	0.024595	-0.002189	-0.001385	0.000418	-0.000543	0.001804	0.0016829	0.0019072	0.300	0.950	.7	10.
3.	-3.0	-6.9	0.070831	-0.002140	-0.002267	0.000549	-0.000610	0.003362	0.0031878	0.0023283	0.301	0.949	.3	15.
4.	-3.0	-7.7	0.077588	-0.001662	-0.002368	0.000510	-0.000713	0.003953	0.0037550	0.0025696	0.300	0.951	.2	16.
5.	-3.0	-8.5	0.085456	-0.001136	-0.002623	0.000647	-0.000952	0.004694	0.0045009	0.0029370	0.299	0.953	.2	17.
6.	-3.0	-9.2	0.090754	-0.000083	-0.003090	0.000600	-0.000680	0.005698	0.0053979	0.0033668	0.298	0.955	- .1	18.
7.	-5.0	-9.8	0.077378	-0.001868	-0.002283	0.000504	-0.000789	0.004798	0.0045965	0.0026670	0.301	0.952	.1	17.
8.	-5.0	-10.5	0.085301	-0.001331	-0.002491	0.000331	-0.000731	0.005631	0.0053857	0.0029917	0.300	0.953	0.0	18.
9.	2.0	1.0	0.051348	-0.002408	-0.002344	0.000539	-0.000531	0.001143	0.0010242	0.0020710	0.298	0.950	.5	10.
10.	2.0	1.5	0.044042	-0.002594	-0.002307	0.000594	-0.000526	0.001086	0.0009865	0.0020823	0.301	0.951	.6	9.
11.	0.0	-4.3	0.086392	-0.001878	-0.003119	0.000569	-0.000286	0.003007	0.0028442	0.0028381	0.302	0.951	.1	15.
12.	0.0	-5.2	0.091484	-0.000793	-0.003345	0.000715	-0.000118	0.003839	0.0036533	0.0032455	0.301	0.954	0.0	16.
13.	0.0	-5.9	0.097128	-0.000299	-0.003267	0.000532	-0.000233	0.004674	0.0046408	0.0040022	0.300	0.953	- .2	17.
14.	5.0	4.1	0.060912	-0.002707	-0.003105	0.000729	-0.000933	0.000222	0.0001551	0.0022705	0.300	0.947	.3	9.
15.	5.0	3.4	0.071398	-0.002627	-0.003332	0.000771	-0.000941	0.000302	0.0002345	0.0024855	0.299	0.950	.3	10.
16.	5.0	1.7	0.085611	-0.001763	-0.003742	0.000883	-0.000579	0.000810	0.0007587	0.0029783	0.301	0.951	.1	12.

Table II - 4. Rotor No. 1, V/OR = .31, M(1.0, 90) = 1.0

TEST 288.0 RUN 11

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	MACAT	A_{1_s}	θ_{grip}
1.	-5.0	-6.1	0.032818	-0.003176	-0.001252	0.000417	-0.000473	0.002844	0.0027214	0.0027498	0.309	0.990	.9	12.
2.	-6.0	-6.9	0.026477	-0.003067	-0.001064	0.000463	-0.000500	0.002824	0.0026983	0.0027274	0.309	0.989	.9	12.
3.	-6.0	-7.2	0.035813	-0.003218	-0.001079	0.000393	-0.000547	0.003193	0.0030847	0.0028387	0.308	0.992	.7	13.
4.	-6.0	-7.9	0.045065	-0.003437	-0.001303	0.000446	-0.000820	0.003599	0.0034651	0.0029119	0.310	0.989	.6	14.
5.	-6.0	-8.6	0.052963	-0.003409	-0.001232	0.000368	-0.000894	0.004167	0.0039924	0.0031178	0.310	0.991	.6	15.
6.	-6.0	-9.5	0.060676	-0.003129	-0.001512	0.000414	-0.000802	0.004693	0.0044980	0.0032202	0.310	0.989	.5	16.
7.	-9.0	-10.6	0.028967	-0.003295	-0.000692	0.000378	-0.000669	0.003398	0.0032531	0.0027946	0.309	0.990	.9	14.
8.	-9.0	-11.2	0.037063	-0.003258	-0.000648	0.000330	-0.000707	0.003935	0.0037705	0.0028888	0.310	0.990	.9	15.
9.	-9.0	-11.8	0.046772	-0.003867	-0.000773	0.000350	-0.000844	0.004603	0.0044458	0.0030483	0.309	0.992	.8	16.
10.	-9.0	-12.6	0.055619	-0.003860	-0.000870	0.000419	-0.001114	0.005301	0.0050986	0.0032046	0.310	0.991	.7	17.
11.	-12.0	-13.6	0.022092	-0.003133	-0.000591	0.000340	-0.000627	0.003406	0.0032316	0.0027248	0.308	0.992	1.0	15.
12.	-12.0	-14.3	0.030287	-0.003063	-0.000534	0.000346	-0.000696	0.003990	0.0038187	0.0027296	0.309	0.990	1.0	16.
13.	-12.0	-15.0	0.039203	-0.003169	-0.000547	0.000345	-0.000811	0.004853	0.0045337	0.0028584	0.309	0.993	.9	17.
14.	-12.0	-13.2	0.013165	-0.002955	-0.000576	0.000318	-0.000418	0.002841	0.0026525	0.0026861	0.308	0.990	1.1	14.
15.	-9.0	-9.9	0.020393	-0.003078	-0.000567	0.000291	-0.000632	0.002916	0.0028093	0.0027811	0.307	0.991	1.1	13.
16.	-8.0	-8.7	0.052671	-0.003895	-0.001710	0.000441	-0.000713	0.003043	0.0029527	0.0029403	0.308	0.991	.6	13.
17.	-8.0	-8.7	0.054079	-0.003759	-0.001690	0.000487	-0.000808	0.003334	0.0032226	0.0032787	0.304	1.002	.6	13.
18.	-6.0	-7.2	0.038040	-0.003705	-0.000987	0.000386	-0.000698	0.003439	0.0033327	0.0031827	0.304	1.002	.7	13.
19.	-6.0	-7.7	0.046465	-0.003770	-0.001026	0.000337	-0.000767	0.003852	0.0037212	0.0032181	0.305	1.000	.6	14.
20.	-6.0	-8.5	0.054652	-0.003740	-0.001240	0.000397	-0.000832	0.004407	0.0042687	0.0034832	0.305	1.002	.3	15.
21.	-6.0	-9.2	0.062702	-0.003650	-0.001423	0.000584	-0.000491	0.004931	0.0046917	0.0034693	0.305	1.000	.2	16.
22.	-9.0	-11.8	0.047521	-0.003489	-0.000823	0.000312	-0.000864	0.004814	0.0046979	0.0033135	0.304	1.002	.6	16.
23.	-9.0	-11.1	0.039102	-0.003564	-0.000481	0.000290	-0.000699	0.004180	0.0040509	0.0031449	0.304	1.002	.9	15.
24.	-9.0	-10.4	0.029124	-0.003402	-0.000414	0.000238	-0.000542	0.003526	0.0034077	0.0029777	0.305	0.999	.9	14.
25.	-9.0	-9.8	0.022671	-0.003458	-0.000338	0.000193	-0.000567	0.003142	0.0030505	0.0029707	0.304	1.000	.9	13.
26.	-6.0	-7.1	0.038148	-0.003726	-0.000872	0.000320	-0.000687	0.003502	0.0033902	0.0031924	0.303	1.004	.7	13.

Table II - 5. Rotor No. 1, V/OR = .35, M(1.0, 90) = .85

TEST 288.0 RUN 4

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.6	0.023605	-0.001544	-0.000707	0.000289	-0.000644	0.001880	0.0018362	0.0016202	0.347	0.849	.7	12.
2.	-5.0	-6.1	0.007561	-0.001562	-0.000589	0.000241	-0.000394	0.001353	0.0013124	0.0016195	0.346	0.849	1.1	10.
3.	-5.0	-11.0	0.050915	-0.000838	-0.000982	0.000345	-0.000886	0.003659	0.0035842	0.0019385	0.346	0.848	.9	16.
4.	-5.0	-13.0	0.072020	0.000219	-0.001893	0.000285	-0.000861	0.004952	0.0048405	0.0022280	0.360	0.844	.5	18.
5.	-5.0	-14.5	0.083082	0.001563	-0.001886	0.000242	-0.000170	0.006436	0.0062898	0.0027458	0.347	0.848	.3	20.
6.	-10.0	-14.7	0.030557	-0.001668	-0.000050	0.000168	-0.000640	0.003091	0.0029696	0.0016416	0.347	0.849	1.1	16.
7.	-10.0	-16.2	0.046667	-0.001038	0.000137	0.000178	-0.000737	0.004528	0.0044772	0.0018932	0.346	0.851	1.0	18.
8.	-10.0	-17.8	0.061176	-0.000265	-0.000107	0.000138	-0.000751	0.006099	0.0059742	0.0021438	0.346	0.850	.8	20.
9.	-12.0	-16.2	0.020225	-0.001898	0.000071	0.000155	-0.000568	0.002596	0.0025852	0.0017222	0.347	0.848	1.1	16.
10.	-12.0	-17.7	0.035862	-0.001246	0.000111	0.000124	-0.000691	0.004090	0.0040242	0.0017763	0.347	0.848	1.1	18.
11.	-12.0	-19.2	0.049892	-0.000521	-0.000172	0.000185	-0.000852	0.005638	0.0055407	0.0020063	0.346	0.850	.9	20.
12.	-15.0	-19.9	0.021115	-0.001848	0.000031	0.000180	-0.000876	0.003186	0.0031337	0.0018318	0.346	0.850	1.1	18.
13.	-15.0	-21.4	0.034969	-0.001359	-0.000072	0.000298	-0.000871	0.004793	0.0046752	0.0019865	0.347	0.846	1.0	20.
14.	-15.0	-18.4	0.005968	-0.002129	-0.000049	0.000088	-0.000236	0.001593	0.0015097	0.0017384	0.346	0.849	1.1	16.
15.	-12.0	-14.5	0.002839	-0.001978	0.000293	0.000026	-0.000652	0.001229	0.0011524	0.0016164	0.347	0.849	1.2	14.
16.	0.0	-5.4	0.067580	-0.000392	-0.002576	0.000702	-0.000641	0.002186	0.0021002	0.0019293	0.356	0.850	.6	14.
17.	0.0	-7.5	0.082632	0.000581	-0.003145	0.000557	-0.000761	0.003168	0.0028951	0.0022445	0.346	0.849	.2	16.
18.	0.0	-9.5	0.091155	0.002701	-0.003695	0.000578	-0.000125	0.004880	0.0046932	0.0032014	0.346	0.849	.1	18.
19.	0.0	-3.9	0.050050	-0.000953	-0.002197	0.000643	-0.000781	0.001630	0.0015132	0.0016755	0.356	0.848	.7	12.
20.	2.0	-2.1	0.061946	-0.000668	-0.003126	0.000833	-0.000813	0.001246	0.0011312	0.0018499	0.356	0.849	.5	12.
21.	2.0	-3.0	0.069800	-0.000401	-0.003491	0.000780	-0.000844	0.001424	0.0013174	0.0019719	0.346	0.847	.3	14.
22.	2.0	-6.1	0.089842	0.001772	-0.004242	0.000748	-0.000225	0.003095	0.0029179	0.0028476	0.346	0.850	0.0	16.
23.	2.0	-0.8	0.044897	-0.000959	-0.002663	0.000675	-0.000896	0.001064	0.0009221	0.0016651	0.347	0.847	.7	10.
24.	-5.0	-7.8	**********	**********	233151862	**********	**********	-13.003391	0.0000000	**********	277.075	0.219		

Table II - 6. Rotor No. 1, V/OR = .35, M(1.0, 90) = .95

TEST 208.0 RUN 10

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-10.0	-10.3	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0011350	0.0011350	0.000	0.713	.5	6.
2.	-10.0	-10.3	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0010218	0.0010218	0.000	0.714	.5	8.
3.	-10.0	-10.3	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0011444	0.0011444	0.000	0.714	.5	10.
4.	-10.0	-10.2	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0017257	0.0017257	0.000	0.715	.3	12.
5.	-10.0	-10.3	0.000000	0.000000	0.000000	0.000000	-0.000000	0.000000	0.0025385	0.0025385	0.000	0.717	0.0	14.
6.	-10.0	-10.4	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0038112	0.0038112	0.000	0.716	0.0	16.
7.	-12.0	-15.2	0.023820	-0.003052	-0.000972	0.000545	-0.000568	0.003368	0.0030851	0.0023583	0.350	0.948	1.2	16.
8.	-12.0	-16.6	0.040484	-0.002877	-0.000893	0.000490	-0.000704	0.004907	0.0045926	0.0025190	0.351	0.948	1.1	18.
9.	-12.0	-17.2	0.046862	-0.002670	-0.000688	0.000503	-0.000766	0.005639	0.0052292	0.0025921	0.352	0.946	1.2	19.
10.	-15.0	-17.6	0.008298	-0.002971	-0.001054	0.000502	-0.000384	0.002298	0.0020440	0.0022918	0.350	0.948	1.4	16.
11.	-15.0	-19.1	0.024675	-0.002999	-0.001042	0.000518	-0.000562	0.004072	0.0036510	0.0023864	0.351	0.948	1.4	18.
12.	-15.0	-19.7	0.031115	-0.002866	-0.000819	0.000581	-0.000542	0.004729	0.0043856	0.0024607	0.352	0.946	1.4	19.
13.	-15.0	-20.2	0.037893	-0.002753	-0.000720	0.000449	-0.000621	0.005549	0.0051423	0.0025442	0.353	0.942	1.4	20.
14.	-12.0	-13.7	0.007309	-0.002901	-0.001049	0.000525	-0.000501	0.002074	0.0018648	0.0023229	0.351	0.949	1.4	14.
15.	-10.0	-12.0	0.017310	-0.002832	-0.000848	0.000443	-0.000439	0.002580	0.0023659	0.0022693	0.352	0.944	1.2	14.
16.	-5.0	-9.7	0.062682	-0.003054	-0.001729	0.000497	-0.000877	0.004186	0.0038612	0.0027506	0.352	0.948	.8	16.
17.	-5.0	-11.5	0.076664	-0.002177	-0.002254	0.000478	-0.000830	0.005597	0.0053103	0.0033419	0.350	0.949	.5	18.
18.	-2.0	-5.9	0.062811	-0.002888	-0.002381	0.000671	-0.000803	0.002926	0.0027114	0.0027041	0.351	0.947	.6	14.
19.	-2.0	-7.6	0.079127	-0.002480	-0.003070	0.000718	-0.000705	0.003997	0.0037632	0.0032504	0.352	0.945	.3	16.
20.	-2.0	-4.4	0.045144	-0.002928	-0.002081	0.000674	-0.000553	0.002331	0.0021384	0.0024768	0.351	0.947	.9	12.
21.	0.0	-2.6	0.058089	-0.003087	-0.002742	0.000706	-0.000630	0.002012	0.0018369	0.0026923	0.351	0.945	.6	12.
22.	0.0	-4.6	0.073648	-0.002651	-0.003250	0.000789	-0.000838	0.002670	0.0024273	0.0030013	0.351	0.948	.5	14.
23.	0.0	-6.2	0.088903	-0.001686	-0.003768	0.000776	-0.000827	0.003905	0.0036678	0.0037513	0.353	0.943	.2	16.

TEST 208.0 RUN 9

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
17.	-5.0	-6.7	0.030990	-0.003010	-0.001281	0.000447	-0.000600	0.002491	0.0023505	0.0023903	0.350	0.952	1.0	12.
18.	-5.0	-7.3	0.039013	-0.003021	-0.001436	0.000505	-0.000629	0.002808	0.0026562	0.0024181	0.350	0.952	.9	13.
19.	-5.0	-8.0	0.047627	-0.003187	-0.001703	0.000538	-0.000724	0.003166	0.0030121	0.0025194	0.350	0.953	.7	14.
20.	-5.0	-8.8	0.054705	-0.003040	-0.001519	0.000455	-0.000879	0.003612	0.0034247	0.0026168	0.350	0.952	1.0	15.
21.	-7.0	-9.5	0.035698	-0.002968	-0.001157	0.000529	-0.000782	0.003117	0.0029789	0.0024026	0.350	0.951	1.0	14.
22.	-7.0	-11.0	0.052246	-0.002921	-0.001222	0.000432	-0.000798	0.004227	0.0040282	0.0026320	0.351	0.952	.8	16.
23.	-7.0	-12.7	0.067651	-0.002480	-0.001482	0.000428	-0.000935	0.005520	0.0053056	0.0029793	0.351	0.951	.7	18.
24.	-7.0	-8.3	0.018020	-0.002663	-0.000932	0.000396	-0.000618	0.002250	0.0021117	0.0022657	0.349	0.949	1.0	12.
25.	-7.0	-7.5	0.009392	-0.002531	-0.000894	0.000370	-0.000481	0.001961	0.0018379	0.0023117	0.351	0.949	1.1	11.
26.	-10.0	-13.6	0.034486	-0.002888	-0.000529	0.000462	-0.000585	0.003825	0.0036614	0.0024824	0.350	0.955	.9	16.
27.	-10.0	-14.1	0.042095	-0.002767	-0.000576	0.000388	-0.000670	0.004479	0.0042771	0.0025484	0.352	0.952	.9	17.
28.	-10.0	-15.0	0.049468	-0.002544	-0.000493	0.000281	-0.000690	0.005164	0.0049765	0.0026772	0.352	0.952	1.0	18.
29.	-10.0	-15.6	0.059010	-0.002564	-0.000939	0.000319	-0.000684	0.006120	0.0058661	0.0029206	0.352	0.953	.8	19.

Table II - 7. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.00

TEST 288.0 RUN 12

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-9.0	-11.8	0.033042	-0.004396	-0.000727	0.000443	-0.001077	0.004197	0.0039485	0.0035807	0.353	0.996	1.1	15.
2.	-9.0	-11.0	0.024956	-0.004773	-0.000765	0.000682	-0.001559	0.003868	0.0034541	0.0036952	0.350	1.003	1.1	14.
3.	-9.0	-12.2	0.041020	-0.004980	-0.000843	0.000777	-0.001649	0.005085	0.0046901	0.0040024	0.352	0.998	.9	16.
4.	-9.0	-13.0	0.049182	-0.005064	-0.001037	0.000758	-0.001827	0.005784	0.0052669	0.0041622	0.350	1.002	.7	17.
5.	-9.0	-10.0	0.017454	-0.004525	-0.000718	0.000571	-0.001351	0.003366	0.0030550	0.0036407	0.349	1.003	1.2	13.
6.	-9.0	-9.9	0.008494	-0.004109	-0.000649	0.000448	-0.000928	0.002913	0.0026392	0.0035910	0.351	1.003	1.2	12.
7.	-12.0	-14.6	0.034764	-0.004448	-0.000656	0.000527	-0.001070	0.004263	0.0039283	0.0036021	0.350	1.002	1.2	16.
8.	-12.0	-13.3	0.032635	-0.004489	-0.000689	0.000616	-0.001171	0.004998	0.0046374	0.0037264	0.351	1.003	1.0	17.
9.	-12.0	-14.0	0.016827	-0.004135	-0.000522	0.000408	-0.000835	0.003578	0.0033202	0.0034907	0.349	1.002	1.0	15.
10.	-12.0	-11.2	0.009816	-0.004027	-0.000706	0.000509	-0.000867	0.002956	0.0027449	0.0034045	0.351	1.001	1.4	14.
11.	-12.0	-12.5	0.002145	-0.003730	-0.000578	0.000430	-0.000557	0.002436	0.0022915	0.0034094	0.349	1.003	1.2	13.
12.	-15.0	-17.1	0.009971	-0.004107	-0.000536	0.000398	-0.000468	0.003281	0.0030216	0.0035011	0.351	1.002	1.2	16.
13.	-15.0	-17.7	0.017915	-0.004243	-0.000664	0.000481	-0.000643	0.004100	0.0037167	0.0035061	0.350	1.005	1.1	17.
14.	-15.0	-18.4	0.026145	-0.004387	-0.000558	0.000574	-0.000816	0.004959	0.0046215	0.0036841	0.353	0.999	1.1	18.
15.	-15.0	-16.4	0.002120	-0.003941	-0.000691	0.000375	-0.000352	0.002600	0.0024016	0.0035458	0.351	1.001	1.4	15.
16.	-12.0	-16.0	0.038937	-0.004389	-0.000589	0.000553	-0.001069	0.005705	0.0054239	0.0039863	0.352	1.002	1.0	17.7
17.	-13.0	-16.8	0.037929	-0.004653	-0.000693	0.000623	-0.001030	0.005754	0.0054200	0.0039164	0.352	1.000	1.0	18.
18.	-14.0	-17.8	0.030306	-0.004296	-0.000471	0.000436	-0.000891	0.005199	0.0048459	0.0036754	0.351	1.003	1.0	18.
19.	-6.0	-8.1	0.041601	-0.004880	-0.001239	0.000659	-0.001047	0.004076	0.0038953	0.0038879	0.352	0.999	.9	14.
20.	-6.0	-8.9	0.051068	-0.004898	-0.001388	0.000612	-0.001171	0.004693	0.0044717	0.0041339	0.352	1.000	.8	15.
21.	-6.0	-9.7	0.059606	-0.005012	-0.001691	0.000668	-0.001216	0.005373	0.0050797	0.0044094	0.353	1.000	.6	16.
22.	-6.0	-7.4	0.035420	-0.004689	-0.001114	0.000511	-0.000943	0.003699	0.0035176	0.0037708	0.351	1.001	.9	13.
23.	-6.0	-6.7	0.026808	-0.004363	-0.001070	0.000491	-0.000898	0.003305	0.0031485	0.0036451	0.351	0.999	1.0	12.
24.	-6.0	-6.2	0.017871	-0.004042	-0.000954	0.000473	-0.000889	0.003001	0.0028604	0.0035936	0.351	1.002	1.0	11.
25.	-3.0	-6.0	0.059267	-0.004982	-0.002166	0.000752	-0.001310	0.004046	0.0037743	0.0041984	0.351	1.002	.7	14.
26.	-3.0	-6.5	0.067395	-0.005030	-0.002150	0.000725	-0.001221	0.004646	0.0043512	0.0045747	0.351	1.001	.5	15.
27.	-3.0	-5.1	0.050728	-0.004992	-0.002049	0.000801	-0.001306	0.003638	0.0034094	0.0040569	0.351	1.001	.6	13.
28.	-3.0	-4.3	0.043878	-0.004964	-0.001780	0.000710	-0.001225	0.003380	0.0031367	0.0039571	0.352	1.001	.7	12.
29.	-3.0	-3.7	0.034888	-0.004681	-0.001442	0.000634	-0.001178	0.003129	0.0028711	0.0038061	0.352	1.001	.8	11.

Table II - 8. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.02

TEST 288.0 RUN 15

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-12.0	-15.4	0.033056	-0.004485	-0.000149	0.000383	-0.000636	0.005083	0.0048940	0.0039453	0.352	1.017	1.1	17.
2.	-12.0	-15.2	0.033232	-0.004570	-0.000254	0.000390	-0.000565	0.005255	0.0050280	0.0041001	0.350	1.024	1.0	17.
3.	-12.0	-14.4	0.026908	-0.004678	-0.000078	0.000337	-0.000575	0.004606	0.0044401	0.0040337	0.351	1.022	1.1	16.
4.	-12.0	-13.6	0.018599	-0.004622	-0.000094	0.000339	-0.000619	0.003905	0.0037679	0.0039728	0.350	1.020	1.2	15.
5.	-12.0	-12.8	0.011827	-0.004557	-0.000037	0.000266	-0.000679	0.003371	0.0032532	0.0039835	0.352	1.020	1.2	14.
6.	-9.0	-10.2	0.027143	-0.004835	-0.000209	0.000275	-0.000641	0.004073	0.0039589	0.0040952	0.352	1.022	1.1	14.
7.	-9.0	-9.6	0.019262	-0.004679	-0.000113	0.000285	-0.000752	0.003633	0.0035342	0.0040719	0.351	1.023	1.0	13.
8.	-9.0	-11.2	0.036598	-0.004817	-0.000228	0.000340	-0.000508	0.004621	0.0044838	0.0041728	0.352	1.020	.9	15.
9.	-9.0	-12.1	0.043149	-0.004861	-0.000182	0.000254	-0.000592	0.005315	0.0051267	0.0043174	0.352	1.022	.8	16.
10.	-15.0	-16.7	0.010923	-0.004573	0.000151	0.000238	-0.000492	0.003636	0.0034880	0.0040354	0.350	1.024	1.4	16.
11.	-15.0	-17.3	0.019103	-0.004616	0.000070	0.000332	-0.000660	0.004398	0.0042214	0.0040258	0.350	1.024	1.2	17.
12.	-15.0	-18.1	0.026059	-0.004543	0.000275	0.000243	-0.000405	0.005085	0.0048822	0.0040085	0.351	1.022	1.1	18.
13.	-13.0	-16.8	0.031288	-0.003268	0.000278	0.000072	-0.000686	0.005858	0.0056354	0.0042210	0.351	1.024	1.0	18.8
14.	-13.0	-15.9	0.028705	-0.004589	-0.000060	0.000342	-0.000390	0.005053	0.0048362	0.0040849	0.350	1.023	1.1	17.

Table II - 9. Rotor No. 1, V/OR = .40, M(1.0, 90) = .85

TEST 208.0 RUN 7

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-4.0	-12.2	0.076055	-0.002867	-0.002899	0.000878	-0.001161	0.004846	0.0046721	0.0031566	0.401	0.845	.7	18.
2.	-4.0	-13.1	0.081132	-0.001576	-0.002909	0.000768	-0.001344	0.005864	0.0054607	0.0034570	0.396	0.853	.6	19.
3.	-4.0	-14.0	0.085539	-0.000962	-0.003104	0.000824	-0.001309	0.006619	0.0063572	0.0039386	0.398	0.850	-1.2	20.
4.	-4.0	-8.3	-0.001280	-0.001964	-0.001617	0.000550	-0.001158	0.001290	0.0012829	0.0020498	0.399	0.849	1.1	8.
5.	-2.0	-5.0	0.043683	-0.002668	-0.002479	0.000790	-0.000940	0.001924	0.0018345	0.0021776	0.396	0.853	.8	12.
6.	-2.0	-3.8	0.027125	-0.002428	-0.002198	0.000810	-0.000144	0.001609	0.0014878	0.0020319	0.398	0.848	1.0	10.
7.	-2.0	-2.0	0.010858	-0.002127	-0.001868	0.000570	-0.000159	0.001432	0.0012590	0.0019500	0.400	0.847	1.1	8.
8.	-2.0	-9.9	0.080468	-0.001851	-0.003413	0.000798	-0.000710	0.004164	0.0039995	0.0031609	0.398	0.850	.6	17.
9.	-2.0	-11.0	0.084194	-0.000780	-0.003762	0.000814	-0.000697	0.004991	0.0047251	0.0034531	0.398	0.851	.3	18.
10.	0.0	-7.6	0.033656	-0.001384	-0.004335	0.000830	-0.000698	0.003834	0.0031181	0.0032624	0.399	0.848	.3	16.
11.	0.0	-8.8	0.037839	-0.000399	-0.004628	0.000848	-0.000786	0.004182	0.0039876	0.0036971	0.398	0.849	.2	17.
12.	0.0	-9.7	0.092076	0.000599	-0.004998	0.001015	-0.000711	0.005188	0.0049452	0.0042128	0.398	0.849	0.0	18.
13.	0.0	-9.7	0.071582	-0.002381	-0.004007	0.000971	-0.000722	0.002217	0.0020522	0.0027009	0.398	0.849	.5	14.

TEST 208.0 RUN 5

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-4.0	-8.7	0.039928	-0.001875	-0.001126	0.000349	-0.000860	0.002664	0.0026519	0.0020923	0.401	0.852	.9	14.
2.	-4.0	-10.6	0.054582	-0.001600	-0.001486	0.000442	-0.000824	0.003497	0.0036048	0.0023682	0.396	0.859	.9	16.
3.	-4.0	-12.5	0.069829	-0.000948	-0.001811	0.000388	-0.000767	0.004796	0.0046558	0.0028052	0.401	0.850	.8	18.
4.	-8.0	-15.2	0.047871	-0.001738	-0.000205	0.000105	-0.000692	0.004585	0.0045879	0.0024145	0.399	0.852	1.1	18.
5.	-8.0	-16.8	0.059219	-0.001127	-0.000214	0.000128	-0.000841	0.005842	0.0057593	0.0027279	0.397	0.857	1.0	20.
6.	-12.0	-17.8	0.025871	-0.002504	0.000153	0.000136	-0.000824	0.003463	0.0034310	0.0022373	0.397	0.856	1.4	18.
7.	-12.0	-19.4	0.038729	-0.002101	0.000133	0.000271	-0.000852	0.005072	0.0049311	0.0024533	0.399	0.853	1.4	20.

Table II - 10. Rotor No. 1, V/OR = .40, M(1.0, 90) = .95

TEST 288.0 RUN 13

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-9.0	-12.4	0.026508	-0.003947	-0.000476	0.000508	-0.000510	0.003112	0.0029692	0.0028278	0.404	0.947	1.4	15.
2.	-9.0	-13.1	0.034273	-0.004032	-0.000664	0.000656	-0.000378	0.003745	0.0035758	0.0029505	0.404	0.948	1.2	16.
3.	-9.0	-11.6	0.019348	-0.003867	-0.000632	0.000559	-0.000491	0.002622	0.0024827	0.0027799	0.403	0.948	1.4	14.
4.	-9.0	-10.9	0.012415	-0.003741	-0.000612	0.000516	-0.000265	0.002181	0.0020720	0.0027713	0.404	0.948	1.4	13.
5.	-12.0	-14.6	0.010793	-0.003908	-0.000292	0.000460	-0.000289	0.002003	0.0022478	0.0028776	0.404	0.947	1.4	15.
6.	-12.0	-15.2	0.017826	-0.003961	-0.000298	0.000537	-0.000302	0.002949	0.0028871	0.0029358	0.404	0.948	1.4	16.
7.	-12.0	-13.1	0.024986	-0.003920	-0.000231	0.000459	-0.000328	0.003569	0.0034642	0.0028801	0.402	0.949	1.2	17.
8.	-12.0	-10.8	0.031208	-0.003893	-0.000377	0.000613	-0.000301	0.004338	0.0041741	0.0030321	0.405	0.947	1.4	18.
9.	-12.0	-17.7	0.038225	-0.004072	-0.000419	0.000536	-0.000720	0.005232	0.0049655	0.0032789	0.404	0.947	1.2	19.
10.	-12.0	-13.9	0.002750	-0.003855	-0.000383	0.000420	-0.000448	0.001665	0.0016124	0.0029049	0.404	0.946	1.4	14.
11.	-15.0	-18.3	0.009077	-0.004036	-0.000400	0.000396	-0.000137	0.002561	0.0023729	0.0029920	0.403	0.948	1.5	17.
12.	-15.0	-19.0	0.015226	-0.004010	-0.000369	0.000408	-0.000137	0.003250	0.0030826	0.0030413	0.402	0.951	1.5	18.
13.	-15.0	-19.7	0.022872	-0.004053	-0.000356	0.000438	-0.000160	0.004018	0.0038494	0.0030683	0.401	0.952	1.4	19.
14.	-15.0	-17.8	0.000997	-0.003927	-0.000298	0.000310	-0.000077	0.001639	0.0015594	0.0029771	0.401	0.950	1.4	16.
15.	-7.0	-9.8	0.031801	-0.003978	-0.000798	0.000508	-0.000559	0.003083	0.0028643	0.0028453	0.403	0.949	1.2	14.
16.	-7.0	-10.8	0.038896	-0.004014	-0.000805	0.000473	-0.000632	0.003810	0.0034714	0.0031002	0.403	0.946	1.1	15.
17.	-8.0	-13.1	0.069435	-0.000854	-0.000989	0.000199	-0.000410	0.004808	0.0045908	0.0017941	0.271	0.899	.1	17.5
18.	-8.0	-13.1	0.036709	-0.001821	-0.001240	0.000173	-0.000322	0.005202	0.0049512	0.0019266	0.270	0.903	.1	18.
19.	-9.0	-14.1	0.031063	-0.001092	-0.001078	0.000171	-0.000306	0.005206	0.0049530	0.0018057	0.271	0.900	0	18.
20.	-9.0	-14.1	0.079185	-0.001582	-0.001114	0.000150	-0.000350	0.005720	0.0054274	0.0019662	0.271	0.902	0	18.5
21.	-9.0	-14.1	0.061267	-0.000693	-0.001040	0.000172	-0.000274	0.006674	0.0064128	0.0016777	0.272	0.900	0	17.4
22.	-8.0	-13.1	0.062109	-0.000483	-0.001137	0.000124	-0.000215	0.004440	0.0042123	0.0016780	0.271	0.899	0	17.
23.	-7.0	-12.1	0.069029	-0.000764	-0.001374	0.000229	-0.000242	0.004463	0.0042473	0.0017745	0.270	0.900	0	17.
24.	-7.0	-12.1	0.060646	-0.000392	-0.001329	0.000217	-0.000224	0.004076	0.0038749	0.0016750	0.270	0.901	0	16.5
25.	-7.0	-12.1	0.078495	-0.001284	-0.001473	0.000242	-0.000386	0.004922	0.0046655	0.0018986	0.271	0.898	0	17.5
26.	-8.0	-14.1	0.059083	0.000836	-0.001354	0.000147	-0.000145	0.004643	0.0044192	0.0016665	0.272	0.901	- .2	17.5
27.	-8.0	-15.1	0.053820	0.001430	-0.001399	0.000129	-0.000140	0.004477	0.0042676	0.0016138	0.271	0.904	- .3	17.5
28.	-9.0	-16.1	0.048820	0.001242	-0.001313	0.000156	-0.000216	0.004388	0.0041729	0.0015741	0.271	0.902	- .3	17.5
29.	-9.0	-13.8	0.064093	-0.000907	-0.000433	0.000146	-0.000402	0.004755	0.0045097	0.0016916	0.271	0.901	.7	17.5
30.	-9.0	-12.8	0.073071	-0.002728	-0.000308	0.000148	-0.000508	0.004894	0.0046241	0.0018186	0.269	0.904	.6	17.5
31.	-9.0	-11.8	0.082566	-0.004735	-0.000331	0.000212	-0.000569	0.005078	0.0048281	0.0020242	0.270	0.902	.6	17.5
32.	-8.0	-10.8	0.088229	-0.005078	-0.000288	0.000231	-0.000577	0.005055	0.0048064	0.0021886	0.269	0.904	.6	17.5
33.	-8.0	-12.8	0.089707	-0.000879	-0.000780	0.000148	-0.000255	0.004850	0.0045954	0.0017889	0.272	0.902	.2	17.5

Table II - 11. Rotor No. 2.

TEST 310.? RUN 3

44 FT. TAPERED TIP ROTOR V/CR = .32 M(1.0)(90) = .87

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90)	$A1_s$
1.	8.0	-12.?	-14.8	?.235846	0.?31189	-?.?? 115	-?.?? 1?5	-?.??.566	0.?03692	?.?037269	?.?020327	0.315	0.871	.2
2.	6.?	-1?.?	-13.1	?.217?41	?.???1387	?.?? 171	?.?? 127	-?.?????0?	0.?02161	?.?022866	0.?017574	0.318	0.873	.3
3.	1?.?	-1?.?	-16.2	?.251649	0.?20487	-?.??? 185	-?.?? 165	-?.??? 784	0.?05116	?.?052?81	0.?023282	0.315	0.878	
4.	12.?	-1?.?	-17.8	?.?66988	-?.?? 498	-?.?? 311	-?.?? 362	-?.??? 639	0.?06892	?.?069?99	0.?027607	0.316	0.874	
5.	13.?	-1?.?	-18.5	?.?73783	-?.??? 948	-?.?? 598	-?.?? 464	-?.??? 791	?.?08?69	?.?079959	0.?032097	0.318	0.874	.2
6.	1?.?	-15.?	-2?.1	?.?28525	?.?? 1?57	?.??? 665	-?.?? 256	-?.??? 678	0.?14?08	?.?040787	0.?019922	0.318	0.871	.5
7.	8.?	-15.?	-18.8	?.?11886	?.?? 1388	?.??? 718	-?.??? 832	-?.??? 617	0.?02184	?.?024187	0.?018551	0.318	0.872	.5
8.	12.?	-15.?	-21.5	?.?44542	?.??? 413	?.??? 265	-?.?? 235	-?.??? 687	?.?05918	?.?059767	0.?022824	0.319	0.872	.3
9.	13.7	-15.?	-22.9	?.?59260	-?.??? 433	?.??? ?28	-?.??? 221	-?.??? 808	?.?08?00	?.?079627	0.?026766	0.319	0.872	.2
10.	1?.?	-5.?	-12.5	?.?77771	-?.??? 095	-?.?? 1661	-?.??? 152	-?.??? 771	?.?05525	?.?055846	0.?029232	0.318	0.873	.0
11.	1?.?	-5.?	-12.5	?.?66894	?.??? 727	-?.?? 1837	-?.??? 154	?.??? 699	?.?05645	?.?056548	0.?039951	0.317	0.870	

TEST 310.? RUN 4

44 FT. TAPERED TIP ROTOR V/CR = .32 M(1.0)(90) = .87

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90)	$A1_s$
1.	1?.?	-5.?	-12.5	?.?73513	?.??? 178	-?.??? 813	-?.??? 236	-?.??? 652	?.?05799	?.?057858	?.?031134	0.326	0.882	
2.	12.?	-5.?	-14.4	?.?84833	-?.??? 519	-?.??? 134	-?.??? 317	-?.??? 493	?.?07423	?.?072771	?.?038450	0.323	0.882	
3.	8.?	-5.?	-11.8	?.?61498	?.??? 869	-?.??? 314	-?.??? 155	-?.??? 552	?.?04078	?.?040263	?.?022803	0.323	0.881	
4.	6.?	-5.?	-8.7	?.?44598	?.??? 473	-?.??? 748	-?.??? 114	-?.??? 468	?.?02839	?.?028483	?.?019121	0.322	0.881	.1
5.	4.?	-5.?	-7.5	?.?25136	?.??? 463	-?.??? 397	-?.??? 122	-?.??? 337	?.?01940	?.?019223	?.?016364	0.322	0.880	.3
6.	2.?	-5.?	-5.9	?.??7911	?.??? 458	-?.??? 212	-?.??? 064	-?.??? 228	?.?01325	?.?013965	?.?015473	0.322	0.883	.0
7.	6.?	?.?	-5.3	?.?73473	?.??? 471	-?.??? 323	-?.??? 138	-?.??? 803	?.?02296	?.?023414	?.?047285	0.326	0.880	-.4
8.	8.?	?.?	-7.5	?.?84615	?.??? 439	-?.??? 343	-?.??? 3?	-?.??? 195	?.?03910	?.?039516	?.?055000	0.327	0.878	.6
9.	1?.?	?.?	-9.4	?.?99981	-?.??? 217	-?.??? 383	-?.??? 54	-?.??? 926	?.?05768	?.?057726	?.?044232	0.324	0.881	
10.	4.?	?.?	-3.5	?.?54761	?.??? 819	-?.??? 516	-?.??? 252	-?.??? 533	?.?01475	?.?014409	?.?017978	0.325	0.881	
11.	2.?	?.?	-1.7	?.?36?45	?.??? 872	-?.??? 951	-?.??? 174	-?.??? 431	?.?01084	?.?010775	?.?015840	0.325	0.880	
12.	?.?	?.?	-?.4	?.?198.7	?.??? 842	-?.??? 552	-?.??? 122	-?.??? 299	?.?00966	?.?009577	?.?015167	0.327	0.880	.1
13.	-1.?	?.?	?.?	?.??11728	?.??? 655	-?.??? 445	-?.??? 123	-?.??? 281	?.?00958	?.?009591	?.?014866	0.325	0.878	
14.	-2.?	?.?	?.7	?.?? 325	?.??? 461	-?.??? 334	-?.??? 114	-?.??? 161	?.?01082	?.?010815	?.?015564	0.325	0.878	
15.	2.?	5.?	2.?	?.?67731	?.??? 829	-?.??? 2475	?.??? 037	-?.??? 933	-?.??? 393	-?.??? 3863	?.?022872	0.324	0.879	
16.	4.?	5.?	?.1	?.?83918	?.??? 1994	-?.??? 3799	?.??? 117	-?.??? 951	?.?02277	?.?023056	?.?027927	0.326	0.879	-.3
17.	?.?	5.?	3.5	?.?43697	?.??? 2771	-?.??? 1913	?.??? 159	-?.??? 815	-?.??? 347	-?.??? 3361	?.?017859	0.325	0.878	.0
18.	-2.?	5.?	5.?	?.?? 642	?.??? 2669	-?.??? 1274	?.??? 133	-?.??? 825	-?.??? 354	-?.??? 2??	?.?016483	0.327	0.881	

Table II - 12. Rotor No. 2.

TEST 317.0 RUN 5

44 FT. TAPERED TIP ROTOR V/CR = .36 M(1.0)(90) = .80

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CC	CP	CPO	V/CR	M(1.0)(90)	$A1_s$
1.	4.0	-12.0	-11.6	0.022319	0.001519	0.000336	-0.000186	-0.000364	0.001243	0.0012286	0.0015727	0.315	0.877	.4
2.	8.0	-12.0	-14.5	0.033342	0.001438	0.000181	-0.000158	-0.000512	0.001491	0.0034630	0.0018952	0.340	0.832	.4
3.	8.0	-14.0	-14.5	0.029219	0.001635	0.000164	-0.000196	-0.000544	0.002294	0.0033054	0.0020004	0.360	0.797	.4
4.	12.0	-12.0	-16.1	0.045062	0.001158	0.000114	-0.000234	-0.000620	0.004899	0.0048156	0.0022669	0.360	0.798	.2
5.	12.0	-12.0	-17.5	0.039618	0.000617	-0.000162	-0.000262	-0.000767	0.006485	0.0063762	0.0026317	0.359	0.797	.2
6.	13.7	-12.0	-19.7	0.037010	-0.001144	-0.000314	-0.000420	-0.000768	0.008421	0.0080951	0.0030287	0.359	0.800	.1
7.	13.7	-15.0	-22.8	0.049570	0.000686	0.000425	-0.000285	-0.000839	0.007188	0.0069876	0.0024439	0.360	0.796	.5
8.	12.0	-15.0	-21.3	0.034668	0.001403	0.000687	-0.000326	-0.000794	0.005083	0.0050413	0.0022428	0.357	0.798	.7
9.	10.0	-15.0	-20.1	0.019439	0.001780	0.000757	-0.000282	-0.000886	0.003260	0.0032915	0.0020677	0.362	0.794	.7
10.	8.0	-15.0	-18.8	0.022805	0.002183	0.000676	-0.000117	-0.000644	0.001438	0.0014920	0.0019559	0.361	0.796	.7
11.	6.0	-15.0	-17.1	-0.013343	0.002474	0.000836	-0.000179	-0.001031	-0.000128	-0.0000790	0.0020237	0.362	0.794	.6
12.	6.0	-10.0	-13.0	0.011366	0.001786	0.000352	-0.000088	-0.000446	0.001931	0.0019225	0.0018355	0.363	0.795	.5
13.	4.0	-10.0	-11.6	-0.005452	0.001805	0.000398	-0.000166	-0.000431	0.000812	0.0008077	0.0017858	0.360	0.797	.5
14.	4.0	-5.0	-7.2	0.022618	0.001716	-0.000360	0.000039	-0.000327	0.001850	0.0019017	0.0017715	0.359	0.797	.3
15.	2.0	-5.0	-6.0	0.003734	0.001651	-0.000169	0.000036	-0.000173	0.001214	0.0011936	0.0016713	0.362	0.791	.4
16.	6.0	-5.0	-9.0	0.041641	0.001693	-0.000764	0.000040	-0.000515	0.002792	0.0028382	0.0020129	0.362	0.792	.1
17.	8.0	-5.0	-10.8	0.059128	0.001445	-0.001175	-0.000082	-0.000494	0.003882	0.0038872	0.0023132	0.357	0.801	.1
18.	12.0	-5.0	-12.5	0.074999	0.000656	-0.001619	-0.000124	-0.000611	0.005503	0.0054037	0.0028822	0.362	0.790	
19.	12.0	-5.0	-14.5	0.085201	-0.000967	-0.002103	-0.000144	-0.000923	0.007370	0.0071613	0.0036164	0.363	0.790	
20.	8.0	0.0	-7.5	0.083256	0.000380	-0.002836	0.000012	-0.000434	0.003497	0.0034880	0.0031338	0.358	0.799	
21.	10.0	0.0	-9.3	0.091238	-0.001275	-0.003661	-0.000185	-0.000953	0.005367	0.0052969	0.0042520	0.358	0.799	
22.	6.0	0.0	-5.5	0.069596	0.001577	-0.002217	0.000042	-0.000662	0.002987	0.0028965	0.0023175	0.358	0.798	
23.	4.0	0.0	-3.6	0.052280	0.001977	-0.001334	-0.000026	-0.000458	0.001329	0.0014235	0.0019371	0.358	0.798	.1
24.	2.0	0.0	-2.0	0.032659	0.001927	-0.000813	-0.000038	-0.000407	0.001018	0.0011152	0.0017313	0.359	0.798	
25.	0.0	0.0	-0.5	0.017333	0.001928	-0.000495	0.000020	-0.000191	0.000955	0.0009885	0.0016659	0.362	0.789	
26.	2.0	5.0	3.7	0.047588	0.002820	-0.001825	0.000179	-0.000452	-0.000527	-0.0004409	0.0018985	0.359	0.798	.2
27.	2.0	5.0	2.0	0.065279	0.002281	-0.002587	0.000135	-0.000631	-0.000583	-0.0004898	0.0022740	0.358	0.800	-.2
28.	3.0	5.0	0.9	0.073652	0.002563	-0.002836	0.000151	-0.000717	-0.000452	-0.0003371	0.0024995	0.358	0.798	
29.	4.0	5.0	-0.1	0.081883	0.002057	-0.003717	0.000210	-0.000653	-0.000252	0.0000773	0.0028920	0.357	0.800	
30.	6.0	5.0	-2.3	0.093374	0.001346	-0.004618	0.000235	-0.000448	0.001483	0.0015848	0.0040187	0.359	0.798	

Table II-12. (Concluded)

TEST 310.0 RUN 13

44 FT. TAPERED TIP ROTOR V/OR = .36 M(1.0)(90) = .80

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.010889	0.001700	-0.000294	-0.000017	-0.000156	0.000977	0.0009120	0.0015105	0.367	0.801	.2
2.	0.0	2.0	1.0	0.025287	0.002192	-0.000796	0.000090	-0.000605	0.000656	0.0005910	0.0010373	0.355	0.804	.2
3.	0.0	4.0	3.0	0.040259	0.002757	-0.001162	0.000015	-0.000450	-0.000005	-0.0000360	0.0010100	0.354	0.804	.2
4.	0.0	6.0	5.0	0.057485	0.004118	-0.001785	0.000030	-0.000703	-0.001196	-0.0010753	0.0022838	0.365	0.803	.2
5.	-2.0	6.0	5.0	0.028465	0.002173	-0.001210	0.000050	-0.000368	0.000025	-0.0000121	0.0017575	0.355	0.803	.2
6.	-2.0	4.0	3.0	0.015820	0.001911	-0.000822	0.000133	-0.000286	0.000645	0.0005438	0.0015986	0.356	0.803	.2
7.	2.0	4.0	3.0	0.078153	0.007045	-0.002996	0.000131	-0.000873	-0.001219	-0.0010776	0.0029511	0.367	0.803	.5
8.	2.0	6.0	5.0	0.092737	0.008670	-0.003691	0.000145	-0.001063	-0.001954	-0.0017556	0.0041860	0.357	0.803	.5
9.	2.0	2.0	1.0	0.060208	0.004985	-0.002311	0.000134	-0.000903	-0.000183	-0.0000849	0.0021819	0.356	0.802	.5
10.	2.0	0.0	-1.0	0.049201	0.003374	-0.001509	-0.000007	-0.000478	0.000722	0.0006671	0.0017378	0.357	0.802	.5
11.	4.0	0.0	-1.0	0.076896	0.007397	-0.002507	0.000085	-0.000818	0.000446	0.0003979	0.0026024	0.365	0.803	.5
12.	4.0	2.0	1.0	0.092042	0.009671	-0.003290	0.000221	-0.001318	0.000002	0.0000362	0.0040152	0.355	0.804	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^o \pm .2^o$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	0	0	- .8	0
2	0	2	- .5	0
3	0	4	0	0
4	0	6	.8	0
5	-2	6	-1.0	0
6	-2	4	-1.4	0
7	2	4	2.4	0
8	2	6	3.6	0
9	2	2	1.8	0
10	2	0	1.2	0
11	4	0	3.4	0
12	4	2	4.3	0

Table II - 13. Rotor No. 2.

TEST 310., RUN 6

44 FT. TAPERED TIP ROTOR V/CR = .36 M(1.0)(90) = .90

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CC	CP	CPC	V/CR	M(1.0)(90)	$A1_s$
1.	6.0	-5.[illegible]	-9.2	[illegible]	[illegible]	[illegible]	[illegible]	-1.[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.903	.2
2.	8.[illegible]	-5.[illegible]	-11.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.907	.1
3.	10.0	-5.0	-12.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.357	0.905	.1
4.	4.[illegible]	-5.[illegible]	-7.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.359	0.900	.3
5.	2.[illegible]	-5.[illegible]	-6.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.363	0.893	.4
6.	2.[illegible]	[illegible]	-1.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.908	.1
7.	0.0	3.0	-0.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.357	0.907	.1
8.	4.0	3.0	-3.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.907	.1
9.	6.0	[illegible]	-5.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.355	0.906	
10.	8.[illegible]	[illegible]	-7.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.904	
11.	4.0	5.[illegible]	-3.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.357	0.903	
12.	6.0	5.0	-2.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.906	
13.	2.[illegible]	5.[illegible]	1.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.902	
14.	[illegible]	5.[illegible]	3.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.903	
15.	-2.[illegible]	5.[illegible]	5.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.357	0.905	
16.	-2.0	7.0	6.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.357	0.905	-.2
17.	[illegible]	7.[illegible]	4.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.903	
18.	2.[illegible]	7.[illegible]	2.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.357	0.905	-.5
19.	4.[illegible]	7.[illegible]	0.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.359	0.905	
20.	6.0	-1[illegible].[illegible]	-13.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.908	.5
21.	8.[illegible]	-1[illegible].[illegible]	-14.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.357	0.903	.5
22.	10.[illegible]	-1[illegible].[illegible]	-16.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.907	.4
23.	11.[illegible]	-1[illegible].[illegible]	-17.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.903	.4
24.	11.[illegible]	-15.[illegible]	-21.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.903	.6
25.	12.[illegible]	-15.[illegible]	-21.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.906	.6
26.	1[illegible].[illegible]	-15.[illegible]	-20.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.358	0.906	.7
27.	8.[illegible]	-15.[illegible]	-18.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.356	0.905	.6

Table II - 14. Rotor No. 2.

TEST 310.0 RUN 16

44 FT. TAPERED TIP ROTOR V/OR = .40 M(1.0)(90) = .83

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.6	0.038214	0.002022	-0.000562	-0.000041	-0.000112	0.002624	0.0023882	0.0019644	0.403	0.828	.1
2.	6.0	5.0	-3.4	0.085994	0.000462	-0.004783	0.000272	-0.000415	0.001669	0.0014509	0.0041671	0.400	0.828	
3.	4.0	5.0	-1.1	0.078450	0.002415	-0.004298	0.000273	-0.000651	0.000205	0.0001584	0.0034826	0.401	0.829	
4.	2.0	5.0	0.9	0.065788	0.003268	-0.003287	0.000148	-0.000716	-0.000628	-0.0005005	0.0028421	0.402	0.829	
5.	0.0	5.0	2.9	0.051240	0.003369	-0.002481	0.000206	-0.000432	-0.000802	-0.0005503	0.0024275	0.401	0.828	-.4
6.	-2.0	5.0	4.4	0.035093	0.003244	-0.001983	0.000138	-0.000537	-0.000291	-0.0003045	0.0021379	0.400	0.829	-.5
7.	-2.0	7.0	5.9	0.049314	0.003543	-0.002722	0.000206	-0.000433	-0.001256	-0.0011591	0.0025112	0.401	0.828	-.6
8.	0.0	7.0	4.2	0.063937	0.003570	-0.003502	0.000162	-0.000528	-0.001587	-0.0014301	0.0028616	0.401	0.828	-.7
9.	2.0	0.0	-2.5	0.035811	0.002685	-0.001246	0.000114	-0.000282	0.001021	0.0009319	0.0019232	0.399	0.831	
10.	4.0	0.0	-4.1	0.051287	0.002630	-0.001867	0.000065	-0.000674	0.001428	0.0012754	0.0021603	0.400	0.830	
11.	6.0	0.0	-6.3	0.064734	0.002315	-0.002533	0.000083	-0.000674	0.002136	0.0019315	0.0025932	0.400	0.830	
12.	8.0	0.0	-8.4	0.075657	0.001243	-0.003039	0.000081	-0.000558	0.003502	0.0031032	0.0032394	0.400	0.829	-.2
13.	8.0	-5.0	-11.5	0.049986	0.002014	-0.000919	-0.000161	-0.000294	0.003689	0.0032982	0.0021984	0.401	0.830	.0
14.	10.0	-5.0	-13.2	0.062732	0.001587	-0.001376	-0.000264	-0.000621	0.005035	0.0044486	0.0026255	0.400	0.831	.1
15.	10.0	-15.0	-20.2	0.008303	0.002578	0.000168	-0.000025	-0.000713	0.002487	0.0021498	0.0022819	0.401	0.831	.1
16.	12.0	-15.0	-21.6	0.021797	0.002129	0.000024	-0.000011	-0.000382	0.004176	0.0036863	0.0022194	0.401	0.830	.6
17.	13.7	-15.0	-23.3	0.037080	0.001723	-0.000192	0.000017	-0.000492	0.006490	0.0055607	0.0022912	0.402	0.830	.7
18.	12.0	-10.0	-18.3	0.048552	0.001385	-0.000307	-0.000116	-0.000443	0.006041	0.0052635	0.0022694	0.402	0.829	.6
19.	10.0	-10.0	-16.6	0.035541	0.001784	-0.000027	-0.000055	-0.000218	0.004424	0.0038960	0.0020523	0.400	0.830	.4
20.	8.0	-10.0	-15.0	0.022210	0.002017	0.000061	-0.000052	-0.000225	0.003087	0.0027113	0.0019328	0.400	0.829	.5
21.	4.0	-5.0	-7.7	0.018459	0.001983	-0.000299	0.000011	-0.000012	0.001843	0.0016420	0.0017676	0.402	0.830	.6
														.3

Table II - 15. Rotor No. 2

TEST 310.) RUN 8

44 FT. TAPERED TIP ROTOR V/CR = .41 M(1.0)(90) = .94

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90	A_{1_s}
1.	8.0	-5.2	-11.4	0.051028	0.033034	-0.000928	-0.000218	-0.000659	0.004205	0.0041631	0.0033364	0.417	0.938	.3
2.	10.0	-5.0	-13.1	0.064664	0.032358	-0.001776	-0.000372	-0.000680	0.005640	0.0055777	0.0039782	0.408	0.939	.2
3.	12.0	-5.1	-14.7	0.073599	0.031368	-0.002253	-0.000354	-0.000958	0.007456	0.0071139	0.0047169	0.408	0.938	.0
4.	6.0	-5.0	-9.4	0.037550	0.032883	-0.000715	-0.000243	-0.000792	0.003036	0.0030770	0.0028259	0.407	0.937	.4
5.	4.0	-5.0	-7.4	0.022963	0.032914	-0.000328	-0.000123	-0.000826	0.002156	0.0022198	0.0026356	0.412	0.938	.3
6.	4.0	-5.0	-4.1	0.025326	0.033739	-0.001797	-0.000204	-0.001197	0.001653	0.0017630	0.0031442	0.411	0.938	.0
7.	6.0	-5.0	-6.1	0.046859	0.033761	-0.002636	-0.000390	-0.001177	0.002650	0.0027095	0.0039800	0.414	0.934	.1
8.	8.0	-5.0	-8.1	0.077569	0.032495	-0.003429	-0.000763	-0.001097	0.004196	0.0042144	0.0048772	0.413	0.934	
9.	10.0	-5.0	-10.1	0.098281	0.031643	-0.003863	-0.000936	-0.001282	0.006043	0.0058828	0.0057487	0.410	0.939	
10.	2.0	-5.0	-2.2	0.036037	0.033785	-0.001141	-0.000125	-0.001098	0.001239	0.0013368	0.0028022	0.408	0.940	
11.	0.0	-5.0	-1.5	0.023448	0.033510	-0.000664	-0.000044	-0.000253	0.001059	0.0011567	0.0025459	0.407	0.945	.1
12.	0.0	5.0	3.7	0.054702	0.035369	-0.002451	0.000043	-0.001463	-0.000522	-0.0004256	0.0033939	0.408	0.946	-.2
13.	2.0	5.0	1.1	0.069490	0.034941	-0.003498	0.000175	-0.001656	-0.000356	-0.0002653	0.0039311	0.409	0.944	-.4
14.	4.0	5.0	-1.0	0.081497	0.034333	-0.004385	0.000158	-0.001429	0.000719	0.0008311	0.0049570	0.407	0.946	
15.	6.0	5.0	-3.3	0.086212	0.033213	-0.004714	0.000239	-0.001507	0.002431	0.0025210	0.0059719	0.407	0.948	
16.	8.0	5.0	-5.2	0.093647	-0.000113	-0.004256	0.000098	-0.001744	0.004332	0.0043823	0.0069852	0.400	0.947	
17.	2.0	7.0	2.2	0.085943	0.034986	-0.005070	0.000310	-0.001909	-0.000888	-0.0007020	0.0052983	0.417	0.930	-.5

TEST 310.) RUN 9

44 FT. TAPERED TIP ROTOR V/CR = .41 M(1.0)(90) = .94

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	0.0	7.0	4.2	0.069357	0.035092	-0.003582	0.000256	-0.001142	-0.001414	-0.0014909	0.0037970	0.413	0.938	
2.	-2.0	7.0	6.3	0.057988	0.036379	-0.002886	0.000291	-0.001121	-0.001412	-0.0013211	0.0035740	0.411	0.939	
3.	2.0	7.0	2.3	0.081236	0.034274	-0.004663	0.000619	-0.001594	-0.000764	-0.0006982	0.0047063	0.410	0.941	
4.	4.0	7.0	0.3	0.096937	0.032434	-0.005278	0.000787	-0.001258	0.000747	0.0007395	0.0057822	0.411	0.941	
5.	8.0	-1.0	-14.6	0.022079	0.032921	-0.001468	-0.000193	-0.000739	0.003445	0.0033277	0.0030520	0.410	0.941	.6
6.	10.0	-1.0	-16.1	0.033635	0.032922	-0.001336	-0.000132	-0.000737	0.004866	0.0047757	0.0034884	0.411	0.940	.8
7.	12.0	-1.0	-17.6	0.047425	0.032572	-0.001222	-0.000245	-0.000609	0.006622	0.0061342	0.0036553	0.411	0.940	.5
8.	13.7	-1.0	-19.4	0.058714	0.031836	-0.000252	-0.000159	-0.000688	0.008524	0.0078363	0.0041706	0.412	0.938	.5
9.	13.7	-15.0	-22.9	0.034548	0.032823	-0.000936	-0.000188	-0.000870	0.006509	0.0062308	0.0035937	0.413	0.937	.8
10.	12.0	-15.0	-21.3	0.018972	0.032762	-0.001216	-0.000257	-0.000859	0.004532	0.0044523	0.0035044	0.413	0.936	.9
11.	10.0	-15.0	-19.8	0.007799	0.032931	-0.001134	-0.000279	-0.000518	0.002864	0.0028712	0.0032024	0.413	0.936	1.0

Table II - 16. Rotor No. 2.

TEST 310.[illegible] RUN 7

44 FT. TAPERED TIP ROTOR V/OR = .45 M(1.0)(90) = .77

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	$A1_s$
1.	8.0	-5.[illegible]	-11.4	0.042920	0.002529	-0.001167	0.000046	-0.000489	0.003460	0.0035201	0.0028684	0.448	0.769	.1
2.	6.0	-5.[illegible]	-9.5	0.027972	0.002427	-0.000731	0.000087	-0.000601	0.002431	0.0025258	0.0024721	0.445	0.772	.3
3.	4.0	-5.[illegible]	-7.7	0.013462	0.002230	-0.000437	0.000107	-0.000315	0.001651	0.0017110	0.0021660	0.444	0.771	.2
4.	10.[illegible]	-5.[illegible]	-13.4	0.055439	0.002273	-0.001658	0.000064	-0.000231	0.004714	0.0047417	0.0034208	0.447	0.773	.1
5.	12.0	-5.0	-15.1	0.064687	0.001673	-0.002219	-0.000114	-0.000488	0.006339	0.0062827	0.0042697	0.447	0.772	.0
6.	13.7	-5.[illegible]	-16.7	0.073788	0.000486	-0.002296	-0.000898	-0.001323	0.008390	0.0081782	0.0052135	0.447	0.772	.0
7.	12.0	-10.[illegible]	-18.2	0.039376	0.002468	-0.000813	-0.000014	-0.000310	0.005365	0.0052070	0.0031542	0.446	0.771	.3
8.	10.0	-10.[illegible]	-16.6	0.028747	0.002525	-0.000930	-0.000097	-0.000172	0.004014	0.0039253	0.0027639	0.445	0.771	.6
9.	8.0	-10.[illegible]	-15.[illegible]	0.014468	0.002602	-0.000049	0.000093	-0.000165	0.002522	0.0024687	0.0024787	0.444	0.771	.6
10.	13.7	-10.[illegible]	-20.[illegible]	0.052807	0.001904	-0.000713	-0.000175	-0.000838	0.007355	0.0071807	0.0037747	0.446	0.770	.2
11.	14.0	-15.0	-23.2	0.025509	0.002886	-0.000584	-0.001242	-0.000431	0.005261	0.0050870	0.0033365	0.449	0.772	.7
12.	13.7	-15.0	-21.7	0.014317	0.002943	0.001687	-0.000119	-0.000394	0.003269	0.0032820	0.0028876	0.443	0.771	.8
13.	10.0	-15.0	-20.4	0.021381	0.003312	0.000703	-0.000204	-0.000844	0.001542	0.0015904	0.0028616	0.447	0.771	.8
14.	6.0	0.0	-6.3	0.057434	0.002682	-0.002307	0.000140	-0.000322	0.001861	0.0019756	0.0029533	0.448	0.770	
15.	8.0	0.0	-8.4	0.066457	0.002335	-0.003045	0.000045	-0.001264	0.003027	0.0031285	0.0039098	0.448	0.770	
16.	10.0	0.0	-10.3	0.078450	0.002627	-0.003958	0.000119	-0.001461	0.005063	0.0051379	0.0050691	0.447	0.772	
17.	4.0	0.0	-4.3	0.043844	0.002716	-0.001705	0.000167	-0.000104	0.001256	0.0014003	0.0025030	0.446	0.770	.1
18.	2.0	0.0	-2.2	0.028589	0.002693	-0.001389	0.000075	-0.000268	0.000914	0.0010839	0.0022387	0.446	0.769	
19.	11.0	0.0	-11.2	0.082471	-0.000193	-0.004063	0.000223	-0.001780	0.006058	0.0060661	0.0055945	0.444	0.768	
20.	2.0	5.0	1.[illegible]	0.061984	0.003771	-0.003272	0.000270	-0.000885	-0.000664	-0.0006993	0.0031625	0.445	0.770	
21.	0.0	5.0	2.8	0.048524	0.003981	-0.002523	0.000284	-0.000635	-0.000770	-0.0006384	0.0029101	0.449	0.770	
22.	-2.0	5.0	4.6	0.033655	0.003815	-0.001903	0.000195	-0.000406	-0.000394	-0.0002553	0.0026981	0.449	0.770	-.4
23.	4.0	5.0	-1.3	0.074156	0.002996	-0.004024	0.000268	-0.000808	-0.000967	0.0000638	0.0039916	0.448	0.770	-.5
24.	6.0	5.0	-3.5	0.083662	0.001686	-0.004875	0.000221	-0.001497	0.001487	0.0015349	0.0051759	0.449	0.770	.0
25.	8.0	5.0	-5.5	0.091390	-0.000628	-0.005514	0.000199	-0.001247	0.003589	0.0036047	0.0064158	0.447	0.773	-.8
26.	10.0	5.0	-7.[illegible]	0.10[illegible]534	-0.002247	-0.003512	0.000124	-0.001389	0.005706	0.0056914	0.0080356	0.447	0.773	.4
27.	[illegible]	7.0	4.0	0.063978	0.004511	-0.003570	0.000221	-0.001096	-0.001824	-0.0017735	0.0034745	0.446	0.772	-.5
28.	-2.0	7.0	6.0	0.049150	0.004488	-0.002700	0.000031	-0.000777	-0.001488	-0.0013959	0.0030814	0.446	0.771	.0
29.	2.0	7.0	2.0	0.076192	0.003945	-0.004339	0.000179	-0.001167	-0.001568	-0.0014593	0.0041032	0.446	0.771	-.7

Table II - 17. Rotor No. 2.

TEST 310.0 RUN 12

44 FT. TAPERED TIP ROTOR V/OR = .46 M(1.0)(90) = .86

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-5.0	-12.0	0.042006	0.003041	-0.000775	-0.000098	-0.000512	0.003569	0.0035693	0.0031800	0.462	0.865	.4
2.	10.0	-5.0	-14.0	0.054996	0.002984	-0.001248	-0.000077	-0.001084	0.004989	0.0049690	0.0039595	0.464	0.862	.4
3.	12.0	-5.0	-15.6	0.064277	0.002303	-0.001719	-0.000078	-0.001216	0.006828	0.0066279	0.0048700	0.463	0.864	.3
4.	6.0	-5.0	-10.0	0.030602	0.003049	-0.000552	-0.000096	-0.000427	0.002625	0.0026246	0.0027439	0.462	0.865	.4
5.	4.0	-5.0	-7.7	0.017161	0.002864	-0.000264	-0.000081	-0.000429	0.001841	0.0018407	0.0024554	0.465	0.863	.4
6.	2.0	-5.0	-6.2	0.001543	0.002449	-0.000004	-0.000061	-0.000092	0.001226	0.0012260	0.0022907	0.462	0.866	.2
7.	4.0	0.0	-4.5	0.048240	0.003354	-0.001811	-0.000018	-0.000487	0.001433	0.0014333	0.0028586	0.462	0.865	
8.	6.0	0.0	-6.8	0.060819	0.003221	-0.002618	0.000078	-0.000973	0.002186	0.0021862	0.0034834	0.465	0.861	
9.	8.0	0.0	-8.9	0.071453	0.002525	-0.003268	0.000078	-0.000866	0.003611	0.0036113	0.0045046	0.464	0.862	
10.	10.0	0.0	-10.9	0.078060	0.001221	-0.003679	0.000024	-0.001342	0.005454	0.0054543	0.0056902	0.465	0.864	
11.	2.0	0.0	-2.6	0.038921	0.003243	-0.001368	0.000040	-0.000737	0.001049	0.0010490	0.0024960	0.466	0.864	
12.	0.0	0.0	-0.8	0.020528	0.003110	-0.000742	-0.000055	-0.000643	0.000901	0.0009013	0.0023275	0.466	0.863	
13.	-2.0	0.0	0.5	0.006242	0.002703	-0.000535	0.000070	-0.000366	0.001048	0.0010477	0.0023029	0.465	0.862	
14.	0.0	2.0	0.5	0.034914	0.003531	-0.001552	0.000040	-0.000597	0.000402	0.0004019	0.0025496	0.466	0.861	
15.	-2.0	2.0	2.0	0.019702	0.003164	-0.000923	0.000103	-0.000586	0.000641	0.0006415	0.0024077	0.464	0.864	
16.	2.0	2.0	-1.5	0.048848	0.003670	-0.002278	0.000128	-0.000717	0.000475	0.0004749	0.0028610	0.468	0.858	
17.	4.0	2.0	-3.7	0.061393	0.003487	-0.002973	0.000202	-0.000992	0.000926	0.0009259	0.0038336	0.464	0.864	
18.	4.0	5.0	-1.8	0.079617	0.002691	-0.004812	0.000277	-0.000881	0.000449	0.0004489	0.0046117	0.468	0.857	
19.	6.0	5.0	-4.0	0.086717	0.001060	-0.005320	0.000373	-0.000985	0.002043	0.0020426	0.0056678	0.468	0.857	
20.	2.0	5.0	0.3	0.067498	0.003732	-0.003912	0.000229	-0.000900	-0.000670	-0.0006897	0.0036768	0.468	0.856	
21.	0.0	5.0	2.1	0.055278	0.003948	-0.003071	0.000153	-0.000622	-0.000795	-0.0007952	0.0031401	0.468	0.856	
22.	-2.0	5.0	4.0	0.040057	0.003766	-0.002374	0.000151	-0.000559	-0.000508	-0.0005083	0.0027835	0.467	0.862	
23.	10.0	-10.0	-16.8	0.027653	0.003050	-0.000005	-0.000012	-0.000466	0.004185	0.0041852	0.0033086	0.464	0.864	.8
24.	8.0	-10.0	-15.3	0.014280	0.002975	0.000120	-0.000117	-0.000362	0.002786	0.0027858	0.0029826	0.463	0.863	.7
25.	6.0	-10.0	-12.9	0.001649	0.002794	0.000143	-0.000041	-0.000289	0.001555	0.0015549	0.0026931	0.462	0.864	.7
26.	12.0	-10.0	-18.3	0.039607	0.002928	-0.000296	0.000256	-0.000583	0.005662	0.0056620	0.0037220	0.464	0.863	.8
27.	13.7	-10.0	-20.3	0.050839	0.002454	-0.000692	-0.000012	-0.000705	0.007463	0.0074625	0.0043477	0.464	0.863	.7
28.	13.7	-12.0	-21.5	0.040048	0.002940	-0.000384	0.000053	-0.000580	0.006754	0.0067538	0.0041380	0.464	0.863	.9
29.	12.0	-12.0	-20.0	0.028818	0.003341	-0.000203	0.000159	-0.000897	0.005076	0.0050761	0.0037710	0.463	0.864	.9
30.	10.0	-12.0	-18.3	0.016025	0.003209	-0.000020	0.000028	-0.000260	0.003438	0.0034378	0.0033340	0.463	0.863	.9
31.	13.7	-15.0	-23.3	0.024380	0.003470	0.000090	-0.000044	-0.000722	0.005326	0.0053257	0.0039278	0.464	0.864	.9
32.	12.0	-15.0	-21.9	0.011852	0.003624	0.000139	-0.000004	-0.000472	0.003347	0.0033469	0.0035397	0.464	0.862	1.1
33.	10.0	-15.0	-20.4	-0.000105	0.003480	-0.000034	0.000064	-0.000530	0.001723	0.0017230	0.0032886	0.462	0.868	1.0

Table II - 18. Rotor No. 2.

TEST 310.0 RUN 11

44 FT. TAPERED TIP ROTOR V/OR = .45 M(1.0)(90) = .90

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	OMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.9	0.030773	0.002970	-0.000785	0.000093	-0.000622	0.002662	0.0026625	0.0027315	0.445	0.900	.3
2.	8.0	-5.0	-11.9	0.044983	0.003057	-0.001154	0.000058	-0.000894	0.003708	0.0037076	0.0032047	0.445	0.901	.4
3.	10.0	-5.0	-13.9	0.059781	0.002662	-0.001619	-0.000075	-0.000992	0.005255	0.0052651	0.0040013	0.447	0.897	.2
4.	12.0	-5.0	-15.5	0.066267	0.002043	-0.002060	0.000013	-0.001229	0.006848	0.0067484	0.0048325	0.446	0.899	.3
5.	13.0	-5.0	-16.4	0.068768	0.000827	-0.002315	-0.000016	-0.001003	0.007698	0.0075383	0.0049439	0.451	0.906	.1
6.	13.0	-5.0	-16.4	0.068903	0.001603	-0.002277	-0.000034	-0.001153	0.007646	0.0075462	0.0053269	0.442	0.900	.1
7.	4.0	-5.0	-7.9	0.017701	0.002939	-0.000538	-0.000061	-0.000512	0.001850	0.0018497	0.0024400	0.439	0.900	.3
8.	2.0	-5.0	-6.0	0.003727	0.002684	-0.000392	0.000068	-0.000435	0.001250	0.0012496	0.0022807	0.439	0.898	.2
9.	2.0	0.0	-2.6	0.033094	0.003844	-0.001544	0.000090	-0.001046	0.001098	0.0010981	0.0027372	0.443	0.898	.1
10.	4.0	0.0	-4.6	0.048282	0.003731	-0.002289	0.000234	-0.000822	0.001493	0.0014929	0.0030181	0.444	0.900	
11.	6.0	0.0	-6.6	0.061392	0.003614	-0.002827	0.000073	-0.000961	0.002386	0.0023863	0.0037850	0.446	0.898	
12.	8.0	0.0	-8.8	0.070868	0.002786	-0.003527	0.000142	-0.001227	0.003811	0.0038110	0.0047665	0.445	0.897	
13.	10.0	0.0	-10.8	0.078276	0.001353	-0.003850	0.000028	-0.002037	0.005775	0.0057746	0.0060310	0.446	0.896	
14.	0.0	0.0	-0.9	0.019831	0.003758	-0.001036	0.000120	-0.000854	0.000970	0.0009703	0.0026184	0.445	0.899	.1
15.	-2.0	0.0	0.6	0.005797	0.003457	-0.000656	0.092029	-0.000729	0.001080	0.0010803	0.0026221	0.447	0.895	.1
16.	2.0	2.0	-1.4	0.049593	0.004936	-0.002192	0.000104	-0.001323	0.000482	0.0004817	0.0033093	0.445	0.895	
17.	4.0	2.0	-3.6	0.063145	0.004517	-0.003187	0.000188	-0.001308	0.001035	0.0010352	0.0037998	0.445	0.896	
18.	0.0	2.0	0.5	0.034470	0.004784	-0.001636	0.000025	-0.001262	0.000486	0.0004865	0.0030953	0.447	0.894	
19.	-2.0	2.0	2.1	0.016110	0.004692	-0.001216	-0.000731	-0.004185	0.000609	0.0006085	0.0029382	0.446	0.895	
20.	-2.0	5.0	4.1	0.048382	0.005275	-0.002332	0.000198	-0.001570	-0.000580	-0.0005797	0.0038647	0.448	0.895	
21.	0.0	5.0	2.4	0.048046	0.006152	-0.003152	0.000138	-0.003754	-0.000761	-0.0007607	0.0037393	0.448	0.894	
22.	2.0	5.0	0.5	0.070687	0.005395	-0.003867	0.000146	-0.001839	-0.000567	-0.0005667	0.0043149	0.447	0.893	
23.	4.0	5.0	-1.7	0.081696	0.003976	-0.004826	0.000332	-0.001671	0.000641	0.0005406	0.0051259	0.447	0.894	
24.	8.0	-10.0	-15.1	0.017147	0.002982	0.000140	0.000001	-0.000259	0.002918	0.0029178	0.0028822	0.450	0.893	.6
25.	6.0	-10.0	-13.2	0.008715	0.002987	0.000035	0.000030	-0.000510	0.001651	0.0016512	0.0026805	0.449	0.892	.6
26.	10.0	-10.0	-16.8	0.031824	0.003067	-0.000009	-0.000065	-0.000594	0.004483	0.0044527	0.0033154	0.447	0.895	
27.	12.0	-10.0	-18.5	0.043574	0.002846	-0.000195	0.000024	-0.000768	0.005960	0.0059597	0.0037296	0.446	0.899	.8
28.	13.7	-10.0	-20.3	0.047725	0.001022	-0.000478	-0.001093	-0.002625	0.007924	0.0079245	0.0045279	0.449	0.896	.5
29.	13.7	-12.0	-21.4	0.040832	0.003023	-0.000340	0.000134	0.000287	0.007158	0.0071578	0.0046045	0.445	0.897	.8
30.	12.0	-12.0	-19.8	0.032574	0.002973	-0.000079	-0.000126	-0.000466	0.005406	0.0054065	0.0036095	0.450	0.887	.7
31.	10.0	-12.0	-18.0	0.020946	0.003107	0.000222	-0.000018	-0.000745	0.003771	0.0037706	0.0031525	0.451	0.888	.9
32.	13.7	-15.0	-23.2	0.029372	0.003120	0.000588	-0.000249	-0.001043	0.005769	0.0057694	0.0036791	0.445	0.897	1.0
33.	12.0	-15.0	-21.7	0.017217	0.003252	0.000666	-0.000366	-0.000758	0.003990	0.0039904	0.0033791	0.452	0.887	1.0
34.	10.0	-15.0	-20.1	0.004187	0.003295	0.000561	-0.001008	-0.000729	0.002349	0.0023486	0.0032939	0.451	0.886	.9

Table II - 19. Rotor No. 2.

TEST 310.1 RUN 1.

44 FT. TAPERED TIP ROTOR V/OR = .51 M(1.0)(90) = .81

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.6	0.022425	0.003987	-0.001046	0.000195	-0.000537	0.002401	0.0024008	0.0034135	0.514	0.805	.4
2.	6.0	3.0	-6.8	0.025423	0.004565	-0.002712	0.000218	-0.001374	0.002879	0.0028787	0.0043092	0.518	0.802	.1
3.	8.0	5.0	-9.0	0.026578	0.004779	-0.003698	0.000253	-0.001868	0.003304	0.0033042	0.0052291	0.519	0.802	.0
4.	4.0	0.0	-4.9	0.023421	0.004191	-0.001809	-0.000078	-0.001078	0.001393	0.0013932	0.0034628	0.511	0.809	.2
5.	2.0	-2.0	-2.8	0.025717	0.004992	-0.002232	0.001218	-0.001040	0.000698	0.0006978	0.0027096	0.512	0.808	.1
6.	2.0	5.0	3.2	0.026096	0.005256	-0.003824	0.000252	-0.002681	-0.000552	-0.0005522	0.0048861	0.521	0.799	
7.	0.0	5.0	2.1	0.025527	0.005299	-0.002415	-0.000822	-0.001806	-0.000943	-0.0009431	0.0040640	0.521	0.799	
8.	-2.0	5.0	4.1	0.029922	0.005497	-0.001981	-0.000011	-0.002073	-0.000725	-0.0007247	0.0037819	0.512	0.809	
9.	8.0	-5.0	-11.8	0.034210	0.004422	-0.001367	0.000257	-0.001366	0.003317	0.0033167	0.0039870	0.512	0.808	.6
10.	10.0	-5.0	-13.7	0.044938	0.004454	-0.001683	0.000763	-0.001601	0.004420	0.0044203	0.0045834	0.508	0.811	.5
11.	12.0	-10.0	-16.8	0.038331	0.004282	-0.001526	0.000275	-0.001688	0.003554	0.0035537	0.0040631	0.509	0.810	.8
12.	12.0	-10.0	-16.5	0.039473	0.004291	-0.001625	-0.000171	-0.001758	0.004041	0.0040413	0.0045432	0.509	0.812	.9
13.	13.7	-10.0	-20.4	0.039466	0.004421	-0.001828	0.000436	-0.001959	0.006472	0.0064716	0.0051189	0.510	0.809	.7
14.	13.7	-12.0	-21.5	0.039227	0.004691	-0.001258	-0.000181	-0.001734	0.005698	0.0056983	0.0048936	0.512	0.810	.9
15.	12.0	-6.0	-17.4	0.034044	0.004284	-0.001775	-0.000329	-0.001123	0.005469	0.0054686	0.0047075	0.512	0.809	.8
16.	10.0	-8.0	-15.7	0.033419	0.004307	-0.001931	0.000319	-0.001745	0.004056	0.0040563	0.0040254	0.510	0.808	.8
17.	8.0	-8.0	-13.9	0.031653	0.004736	-0.002722	0.000335	-0.001711	0.002789	0.0027896	0.0036351	0.510	0.808	.8
18.	8.0	-3.0	-11.8	0.029307	0.004648	-0.002226	0.000149	-0.001549	0.003422	0.0034198	0.0044805	0.512	0.809	.6
19.	6.0	-3.0	-8.8	0.032839	0.004108	-0.001793	0.000355	-0.001625	0.002442	0.0024422	0.0036042	0.510	0.810	.5
20.	4.0	-3.0	-6.6	0.032683	0.003966	-0.001762	0.000530	-0.000729	0.001840	0.0018396	0.0032283	0.510	0.810	.4
21.	4.0	2.0	-3.7	0.033844	0.004533	-0.001368	-0.000217	-0.001497	0.002681	0.0026807	0.0052496	0.516	0.811	
22.	2.0	2.0	-1.6	0.033216	0.004641	-0.001217	0.000078	-0.001407	0.000554	0.0005545	0.0036067	0.512	0.808	
23.	6.0	2.0	-5.8	0.035608	0.004471	-0.003538	0.000240	-0.001869	0.001858	0.0018577	0.0050986	0.511	0.810	

Table II-19. (Concluded)

TEST 310.0 RUN 14

44 FT. TAPERED TIP ROTOR V/OR = .51 M(1.0)(90) = .81

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	2.0	-2.0	-4.0	0.016586	0.003254	-0.000687	-0.000033	-0.000283	0.001277	0.0012825	0.0026617	0.514	0.805	.3
2.	2.0	-2.0	-3.0	0.026185	0.004285	-0.000901	-0.000029	-0.000609	0.001131	0.0011118	0.0028208	0.517	0.803	.2
3.	2.0	0.0	-1.0	0.048181	0.006329	-0.001738	-0.000017	-0.001039	0.000157	0.0002447	0.0033858	0.514	0.805	.2
4.	2.0	2.0	1.0	0.076474	0.009794	-0.002878	0.000097	-0.001250	-0.001068	-0.0009358	0.0052405	0.518	0.799	.2
5.	0.0	0.0	-1.0	0.016944	0.003288	-0.000729	-0.000041	-0.000148	0.000999	0.0009423	0.0026076	0.511	0.806	.2
6.	0.0	2.0	1.0	0.038915	0.004712	-0.001637	-0.000129	-0.000629	0.000074	0.0001221	0.0031617	0.513	0.805	.2
7.	0.0	4.0	3.0	0.063241	0.007278	-0.002527	-0.000187	-0.001235	-0.001665	-0.0014673	0.0043300	0.513	0.805	.2
8.	0.0	6.0	5.0	0.087219	0.009602	-0.003391	0.000037	-0.001471	-0.003042	-0.0026958	0.0065611	0.515	0.805	.2
9.	-2.0	6.0	5.0	0.051681	0.004876	-0.002825	-0.000031	-0.000564	-0.001541	-0.0013806	0.0037603	0.514	0.804	.1
10.	-2.0	4.0	3.0	0.028909	0.003636	-0.001678	-0.000085	-0.000571	0.000116	0.0001206	0.0029580	0.510	0.809	.1
11.	4.0	0.0	-1.0	0.087023	0.012557	-0.003416	0.000492	-0.001488	0.000251	0.0003019	0.0063242	0.510	0.808	.1
12.	4.0	-2.0	-3.0	0.066146	0.009993	-0.002664	0.000075	-0.001630	0.000646	0.0006424	0.0043658	0.513	0.804	.1
13.	4.0	-4.0	-5.0	0.041634	0.006298	-0.001503	0.000013	-0.000751	0.001494	0.0013890	0.0030255	0.510	0.808	.1

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^o \pm .2^o$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	2	-2	0	0
2	2	-2	1.4	0
3	2	0	2.9	0
4	2	2	4.8	0
5	0	0	0	0
6	0	2	1.4	0
7	0	4	2.9	0
8	0	6	4.3	0
9	-2	6	.8	0
10	-2	4	- .7	0
11	4	0	6.7	0
12	4	-2	5.3	0
13	4	-4	3.4	0

Table II - 20. Rotor No. 2.

TEST 310.0 RUN 15

44 FT. TAPERED TIP ROTOR V/OR = .52 M(1.0)(90) = .81

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-10.1	0.023627	0.004043	-0.000595	-0.000193	-0.000715	0.002469	0.0022069	0.0032143	0.526	0.811	.5
2.	8.0	-5.0	-12.0	0.036362	0.004439	-0.001154	-0.000024	-0.001052	0.003304	0.0029701	0.0035596	0.522	0.814	.5
3.	10.0	-5.0	-14.1	0.047585	0.004662	-0.001646	-0.000063	-0.001049	0.004823	0.0040518	0.0042038	0.523	0.812	.4
4.	12.0	-5.0	-15.8	0.055494	0.004265	-0.002035	-0.000144	-0.001370	0.006034	0.0053004	0.0048435	0.522	0.812	.4
5.	12.0	-7.0	-17.0	0.046165	0.004673	-0.001258	-0.000011	-0.000993	0.005319	0.0049301	0.0043093	0.524	0.810	.7
6.	12.0	-10.0	-18.6	0.029926	0.004802	-0.000419	-0.000089	-0.000729	0.004867	0.0041751	0.0038868	0.522	0.811	1.0
7.	10.0	-7.0	-15.3	0.036898	0.004527	-0.000904	-0.000012	-0.000665	0.004365	0.0037786	0.0037098	0.521	0.811	.9
8.	8.0	-7.0	-13.3	0.026329	0.004405	-0.000735	-0.000364	-0.000810	0.003252	0.0028128	0.0038849	0.521	0.810	.8
9.	8.0	0.0	-9.3	0.064825	0.003386	-0.003196	-0.000070	-0.001430	0.003607	0.0030012	0.0045620	0.521	0.809	.2
10.	6.0	0.0	-7.1	0.055322	0.004117	-0.002799	-0.000056	-0.001243	0.002016	0.0018455	0.0038420	0.521	0.814	.3
11.	4.0	0.0	-4.9	0.046657	0.004084	-0.002104	-0.000051	-0.000709	0.001354	0.0012606	0.0033063	0.524	0.809	.2
12.	2.0	0.0	-2.9	0.032504	0.003744	-0.001441	-0.000026	-0.000600	0.001087	0.0009530	0.0028641	0.524	0.809	.2
13.	2.0	2.0	-1.6	0.046169	0.004001	-0.002286	0.000012	-0.000686	0.000484	0.0004284	0.0032517	0.522	0.812	.1
14.	0.0	2.0	0.2	0.033740	0.003874	-0.001713	0.000060	-0.000594	0.000492	0.0003959	0.0029725	0.521	0.811	.1
15.	0.0	5.0	2.0	0.054054	0.004268	-0.003315	0.000072	-0.000626	-0.000946	-0.0007831	0.0037155	0.518	0.814	
16.	0.0	7.0	3.2	0.068557	0.004097	-0.004557	0.000132	-0.000851	-0.001930	-0.0016774	0.0045585	0.520	0.810	
17.	2.0	5.0	0.2	0.064473	0.003935	-0.004078	0.000031	-0.000820	-0.000717	-0.0005722	0.0041648	0.518	0.814	
18.	4.0	5.0	-2.1	0.075696	0.003124	-0.005293	0.000283	-0.001029	0.000352	0.0002781	0.0050921	0.524	0.807	
19.	4.0	2.0	-3.7	0.055317	0.003549	-0.004134	-0.000126	-0.000802	0.001003	0.0009034	0.0036444	0.527	0.805	
20.	6.0	2.0	-5.9	0.066061	0.003276	-0.003932	0.000189	-0.001247	0.001984	0.0017418	0.0044419	0.522	0.810	
21.	6.0	-3.0	-8.8	0.038400	0.004290	-0.001499	0.000072	-0.000776	0.002469	0.0021692	0.0032504	0.521	0.809	.4
22.	4.0	-3.0	-6.8	0.024971	0.005334	-0.134523	0.192017	-0.002960	0.041599	0.0016847	0.0037697	0.526	0.804	.5
23.	8.0	-3.0	-10.9	0.049367	0.004406	-0.002005	0.000030	-0.001167	0.003296	0.0029619	0.0037843	0.519	0.813	.5
24.	10.0	-3.0	-12.8	0.056758	0.004054	-0.002600	0.000069	-0.001599	0.004875	0.0040871	0.0044885	0.519	0.812	.4

Table II - 21. Rotor No. 3.

TEST 310.0 RUN 19

34 FT. 0012 ROTOR V/OR = .51 M(1.0)(90) = .63

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-2.0	-9.6	0.046005	0.004323	-0.002206	-0.000205	0.006463	0.003024	0.0028436	0.0040947	0.511	0.648	.0
2.	10.0	-2.0	-11.6	0.056616	0.004608	-0.002827	0.000021	0.006402	0.003965	0.0037217	0.0048651	0.512	0.647	.0
3.	6.0	-2.0	-7.8	0.037184	0.004234	-0.002568	0.001227	0.006751	0.002865	0.0022558	0.0036787	0.514	0.644	.0
4.	4.0	-2.0	-5.8	0.029564	0.003674	-0.001259	-0.000228	0.006514	0.001797	0.0017716	0.0031824	0.508	0.643	.0
5.	2.0	-2.0	-3.7	0.012549	0.003562	-0.000668	0.000812	0.007035	0.001306	0.0013811	0.0029683	0.512	0.644	.4
6.	0.0	-2.0	-2.0	0.000672	0.003392	-0.000252	-0.000080	0.006589	0.001137	0.0011443	0.0028651	0.511	0.644	.5
7.	0.0	2.0	0.7	0.029484	0.003851	-0.002350	0.001399	0.006673	0.001152	0.0006763	0.0030295	0.512	0.641	
8.	2.0	2.0	-1.2	0.036261	0.004005	-0.002182	-0.000057	0.006361	0.000789	0.0006718	0.0032641	0.508	0.642	
9.	4.0	2.0	-3.3	0.048564	0.004058	-0.003036	0.000384	0.006589	0.001231	0.0010761	0.0038726	0.512	0.641	
10.	6.0	2.0	-5.5	0.058471	0.004316	-0.003838	0.000182	0.005049	0.001769	0.0016368	0.0046639	0.511	0.640	
11.	8.0	2.0	-7.2	0.068394	0.004056	-0.004321	0.000061	0.005222	0.002878	0.0024352	0.0054269	0.511	0.640	
12.	10.0	2.0	-8.8	0.079146	0.003877	-0.005276	0.000322	0.004484	0.004191	0.0037198	0.0067122	0.511	0.639	
13.	10.0	0.0	-10.2	0.068045	0.004457	-0.003828	-0.000121	0.005080	0.004008	0.0036887	0.0056594	0.509	0.641	
14.	12.0	-2.0	-15.7	0.088295	0.004390	-0.003686	-0.000136	0.005358	0.005780	0.0051166	0.0058353	0.509	0.641	
15.	12.0	-4.0	-14.6	0.086791	0.004860	-0.002757	-0.000014	0.005471	0.005447	0.0049261	0.0051658	0.507	0.643	
16.	10.0	-4.0	-12.7	0.044636	0.004485	-0.002082	-0.000005	0.005905	0.004254	0.0038069	0.0043643	0.512	0.639	
17.	8.0	-4.0	-11.1	0.034220	0.004188	-0.001515	-0.000065	0.005875	0.003289	0.0029804	0.0038068	0.510	0.641	
18.	6.0	-4.0	-9.1	0.026899	0.003883	-0.001145	0.000191	0.006067	0.002537	0.0022832	0.0033298	0.509	0.638	
19.	4.0	-4.0	-7.2	0.011893	0.003492	-0.000585	-0.000273	0.006091	0.001768	0.0017114	0.0030488	0.507	0.639	
20.	6.0	-6.0	-10.9	0.012391	0.003741	-0.000451	-0.000105	0.005962	0.002132	0.0020298	0.0032499	0.507	0.639	
21.	8.0	-6.0	-12.1	0.026956	0.004205	-0.000874	-0.000079	0.005629	0.003100	0.0028311	0.0035893	0.508	0.639	
22.	10.0	-6.0	-13.8	0.033842	0.004443	-0.001108	-0.000020	0.005533	0.004091	0.0037397	0.0041153	0.511	0.638	
23.	12.0	-6.0	-15.8	0.047187	0.004842	-0.001865	-0.000070	0.005280	0.005569	0.0050282	0.0048217	0.510	0.637	
24.	14.0	-6.0	-17.8	0.061482	0.005096	-0.001935	-0.000299	0.005154	0.007298	0.0066486	0.0057088	0.511	0.637	
25.	8.0	0.0	-8.5	0.056982	0.004081	-0.003142	0.000168	0.005772	0.002922	0.0026991	0.0045754	0.511	0.637	
26.	6.0	0.0	-6.7	0.046701	0.003978	-0.002521	0.000051	0.006070	0.002210	0.0020543	0.0039432	0.510	0.637	
27.	4.0	0.0	-4.7	0.035182	0.003859	-0.001962	-0.000195	0.005902	0.001623	0.0014904	0.0033797	0.510	0.637	
28.	2.0	0.0	-2.5	0.025141	0.003805	-0.001369	-0.000088	0.006094	0.001162	0.0010876	0.0029890	0.510	0.637	
29.	0.0	0.0	-0.5	0.012107	0.003608	-0.000774	-0.000070	0.006164	0.001023	0.0009986	0.0028209	0.508	0.638	
30.	0.0	4.0	2.0	0.036717	0.004566	-0.002292	0.000096	0.005563	0.000031	0.0000400	0.0035655	0.508	0.638	
31.	0.0	6.0	3.1	0.047231	0.004904	-0.003002	-0.000108	0.005651	-0.000840	-0.0006883	0.0042112	0.513	0.637	
32.	2.0	6.0	1.5	0.059468	0.004547	-0.003858	0.000188	0.006239	-0.000784	-0.0006056	0.0046832	0.513	0.637	
33.	2.0	4.0	0.1	0.047546	0.004660	-0.002766	-0.000120	0.005517	0.000179	0.0001201	0.0040490	0.511	0.639	
34.	4.0	4.0	-2.1	0.059570	0.004249	-0.003687	-0.000057	0.006040	0.000626	0.0004412	0.0045126	0.512	0.639	.6
35.	4.0	6.0	-0.9	0.069718	0.003867	-0.004547	0.000294	0.005817	0.000066	0.0000398	0.0053060	0.510	0.641	.0
36.	6.0	6.0	-2.9	0.081485	0.003246	-0.005350	0.000088	0.005714	0.001014	0.0008493	0.0064657	0.514	0.637	
37.	6.0	4.0	-4.2	0.070468	0.003988	-0.004576	0.000012	0.005874	0.001628	0.0013347	0.0055917	0.514	0.637	
38.	6.0	8.0	-1.7	0.094068	0.002004	-0.006294	0.000487	0.005636	0.000622	0.0005257	0.0077084	0.513	0.637	
39.	4.0	8.0	0.2	0.084258	0.003081	-0.005358	0.000271	0.005779	-0.000860	-0.0006075	0.0064895	0.510	0.635	
40.	4.0	10.0	1.5	0.097115	0.002081	-0.006016	0.000321	0.005776	-0.001482	-0.0011745	0.0078669	0.510	0.635	.0

Table II-21. (Concluded)

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = .5 M(1.0)(90) = .63

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	2.0	-4.0	-5.2	0.002484	0.003283	-0.000724	-0.000150	0.004948	0.001420	0.0012180	0.0027834	0.505	0.621	
37.	4.0	-6.0	-8.6	0.002673	0.003375	-0.000607	-0.000124	0.004956	0.001526	0.0013768	0.0029309	0.505	0.623	.1
38.	6.0	10.0	-0.5	0.103749	0.001034	-0.005766	0.000294	0.003558	0.000145	0.0002915	0.0091958	0.503	0.623	.0
39.	8.0	8.0	-3.8	0.098191	0.001212	-0.004902	0.000231	0.004210	0.002087	0.0017908	0.0086799	0.505	0.623	.1
40.	8.0	6.0	-4.8	0.087975	0.002455	-0.004895	0.000310	0.004307	0.002243	0.0018743	0.0072623	0.505	0.623	.0
41.	8.0	4.0	-6.1	0.080616	0.003762	-0.004952	0.000020	0.004033	0.002373	0.0019577	0.0062838	0.506	0.624	.0
42.	10.0	4.0	-7.5	0.087455	0.002784	-0.004439	0.000260	0.004201	0.003978	0.0033742	0.0073812	0.507	0.624	.2
43.	12.0	0.0	-12.1	0.078789	0.003302	-0.003746	0.000694	0.003920	0.005844	0.0051221	0.0063816	0.504	0.623	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
25	4	7	0	.7
39	8	8	0	.7
40	8	6	0	.4
42	10	4	0	.6
43	12	0	0	.6

Table II - 22. Rotor No. 3.

TEST 310.0 RUN 29

34 FT. 0012 ROTOR V/OR = .65 M(1.0)(90) = .54

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-0.9	0.010147	0.004985	-0.001162	-0.000035	0.009854	0.001320	0.0011998	0.0044359	0.650	0.540	-1.0
2.	0.0	2.0	-0.0	0.022680	0.005254	-0.001985	-0.000144	0.010279	0.000870	0.0007986	0.0047150	0.652	0.541	- .7
3.	0.0	4.0	0.9	0.037955	0.005775	-0.002577	-0.000583	0.010399	0.000016	0.0001331	0.0055556	0.653	0.542	
4.	0.0	6.0	2.0	0.047867	0.006054	-0.003570	-0.000498	0.010700	-0.000741	-0.0006656	0.0057831	0.654	0.542	-1.4
5.	0.0	7.0	2.4	0.053058	0.006072	-0.004197	-0.000706	0.007906	-0.001424	-0.0010645	0.0069161	0.650	0.540	-1.4
6.	0.0	8.0	3.0	0.061867	0.005910	-0.004864	-0.000050	0.007609	-0.002035	-0.0015968	0.0076118	0.649	0.540	
7.	0.0	5.0	1.6	0.040981	0.005761	-0.003115	-0.000542	0.008926	-0.000196	-0.0002661	0.0057073	0.650	0.541	-1.1
8.	2.0	5.0	-0.6	0.047566	0.006021	-0.003810	-0.000835	0.008776	-0.000024	-0.0001345	0.0063825	0.653	0.539	-1.0
9.	2.0	6.0	-0.2	0.051515	0.005420	-0.004735	-0.000314	0.008947	-0.000402	-0.0003992	0.0064737	0.650	0.540	-1.0
10.	2.0	7.0	0.1	0.057683	0.005310	-0.005338	-0.000404	0.008260	-0.000993	-0.0007984	0.0070266	0.650	0.540	-1.1
11.	2.0	8.0	0.6	0.066735	0.005300	-0.005516	-0.000236	0.007830	-0.001717	-0.0013306	0.0078928	0.649	0.540	
12.	2.0	4.0	-1.4	0.043009	0.006240	-0.003465	-0.000345	0.008659	0.000506	0.0002661	0.0061742	0.650	0.541	- .8
13.	2.0	2.0	-2.3	0.030045	0.006023	-0.002813	0.000024	0.008281	0.001003	0.0009316	0.0054820	0.650	0.541	- .7
14.	2.0	0.0	-3.2	0.017574	0.005761	-0.001695	-0.000500	0.008892	0.001383	0.0013308	0.0050657	0.651	0.541	- .6
15.	2.0	-2.0	-4.2	0.008002	0.005592	-0.001097	-0.000091	0.008906	0.001411	0.0014637	0.0049083	0.649	0.540	- .5
16.	4.0	-2.0	-6.5	0.013886	0.006020	-0.001745	-0.000078	0.008680	0.001798	0.0017299	0.0053166	0.650	0.541	- .4
17.	4.0	-4.0	-7.5	0.003681	0.006673	-0.000847	-0.000485	0.008830	0.001717	0.0016142	0.0051498	0.655	0.539	- .3
18.	4.0	0.0	-5.7	0.024088	0.006170	-0.002373	-0.000230	0.008981	0.001728	0.0016141	0.0056222	0.654	0.539	- .4
19.	4.0	2.0	-4.5	0.037773	0.006360	-0.003885	0.000177	0.008861	0.001404	0.0010760	0.0060227	0.654	0.539	- .6
20.	4.0	3.0	-4.1	0.044587	0.006400	-0.004132	0.000143	0.009377	0.001157	0.0008071	0.0064176	0.654	0.539	- .5
21.	4.0	4.0	-3.6	0.051446	0.006299	-0.004709	-0.000041	0.008952	0.000796	0.0005380	0.0068627	0.654	0.539	- .7
22.	4.0	5.0	-3.1	0.054696	0.005875	-0.005235	0.000258	0.009715	0.000599	0.0004035	0.0071963	0.653	0.539	- .7
23.	4.0	6.0	-2.5	0.059899	0.005651	-0.005619	-0.000208	0.009287	0.000186	-0.0001347	0.0074617	0.654	0.538	- .8
24.	4.0	7.0	-2.0	0.067518	0.006022	-0.006063	-0.000190	0.008313	-0.000473	-0.0006737	0.0083967	0.654	0.538	- .9
25.	4.0	8.0	-1.5	0.072790	0.004967	-0.006685	0.000419	0.007480	-0.000642	-0.0008084	0.0087688	0.653	0.538	-1.0
26.	6.0	7.0	-3.9	0.074168	0.005449	-0.006615	-0.000105	0.008697	0.000558	0.0004042	0.0095789	0.654	0.538	- .6
27.	6.0	8.0	-3.5	0.079040	0.004363	-0.006134	0.000107	0.009465	0.000363	0.0002695	0.0099827	0.654	0.538	
28.	6.0	6.0	-4.5	0.065712	0.005906	-0.006552	-0.000036	0.007916	0.000752	0.0004042	0.0085295	0.654	0.538	- .8
29.	6.0	4.0	-5.6	0.056222	0.006588	-0.005583	0.000178	0.008272	0.001429	0.0009434	0.0076794	0.657	0.539	
30.	6.0	2.0	-6.6	0.043166	0.006716	-0.004556	0.000706	0.008431	0.001955	0.0014821	0.0067624	0.654	0.538	
31.	6.0	0.0	-7.6	0.032187	0.006727	-0.003426	0.000360	0.009060	0.001974	0.0018864	0.0062350	0.654	0.538	- .2
32.	6.0	-2.0	-8.7	0.021500	0.006793	-0.002208	-0.000193	0.009245	0.002111	0.0018864	0.0058111	0.654	0.538	- .2
33.	6.0	-4.0	-9.5	0.008262	0.005996	-0.001188	0.000016	0.009395	0.001927	0.0018897	0.0054209	0.654	0.538	.0
34.	8.0	-4.0	-11.6	0.015617	0.006900	-0.001297	-0.000679	0.009294	0.002504	0.0024297	0.0062082	0.654	0.538	.0
35.	8.0	-6.0	-12.6	0.006651	0.006925	-0.001012	0.548506	0.009290	-0.055256	0.0018898	0.0059403	0.655	0.538	.0

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Table II-22. (Concluded)

TEST 310.0 RUN 28

34 FT. 0012 ROTOR V/OR = .35 M(1.0)(90) = .54

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	8.0	-2.0	-10.7	0.027573	0.007219	-0.002432	-0.000029	0.009807	0.002529	0.0024298	0.0064837	0.655	0.538	.1
37.	8.0	0.0	-9.7	0.037584	0.006920	-0.003765	0.000290	0.009177	0.002524	0.0022947	0.0067517	0.654	0.538	- .1
38.	8.0	2.0	-8.7	0.049562	0.006599	-0.004949	0.000733	0.008972	0.002447	0.0020248	0.0073516	0.655	0.538	- .1
39.	8.0	4.0	-7.5	0.062562	0.006387	-0.005614	0.000293	0.008481	0.002072	0.0017547	0.0080816	0.654	0.538	.0
40.	8.0	6.0	-6.0	0.075342	0.006156	-0.005741	0.000262	0.007690	0.002022	0.0017548	0.0106362	0.654	0.538	.4
41.	8.0	8.0	-4.0	0.101586	0.007325	-0.006365	0.000332	0.005711	0.002141	0.0018898	0.0153902	0.655	0.538	.4
42.	10.0	6.0	-6.0	0.104245	0.010636	-0.006245	0.000756	0.004153	0.004243	0.0036441	0.0171360	0.653	0.538	.0
43.	10.0	4.0	-8.0	0.081245	0.009274	-0.006284	0.000223	0.005463	0.003620	0.0031164	0.0125999	0.657	0.538	.3
44.	10.0	2.0	-10.0	0.058790	0.008102	-0.005109	0.000488	0.008090	0.003225	0.0028405	0.0093426	0.657	0.539	.5
45.	10.0	0.0	-11.5	0.044512	0.008064	-0.004379	0.000743	0.008408	0.003279	0.0029750	0.0081488	0.655	0.538	.1
46.	10.0	-2.0	-12.5	0.035183	0.008517	-0.003269	0.000033	0.008604	0.003287	0.0029748	0.0076784	0.654	0.538	.2
47.	10.0	-4.0	-13.5	0.022188	0.007761	-0.001849	-0.000156	0.009311	0.003059	0.0028399	0.0068734	0.655	0.538	.3
48.	10.0	-6.0	-14.5	0.012395	0.007543	-0.001178	0.000969	0.009518	0.002858	0.0025895	0.0066298	0.656	0.538	.4
49.	10.0	-8.0	-15.4	0.002803	0.007728	-0.000367	-0.000177	0.008758	0.002093	0.0018931	0.0065463	0.655	0.538	.4

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^o \pm .2^o$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
40	8	6	1.0	0
41	8	8	2.9	0
42	10	6	4.8	0
43	10	4	2.9	0
43	10	2	.5	0

Table II - 23. Rotor No. 3.

TEST 310.0 RUN 20

34 FT. 0012 ROTOR V/OR = .75 M(1.0)(90) = .50

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	0.0	-9.5	0.042483	0.007378	-0.003689	0.000086	0.011269	0.002507	0.0023610	0.0072555	0.675	0.538	
2.	6.0	0.0	-7.6	0.034085	0.006486	-0.003241	-0.000209	0.011667	0.002138	0.0018053	0.0061226	0.674	0.537	
3.	6.0	0.0	-7.8	0.025685	0.007874	-0.003312	0.000025	0.012568	0.001803	0.0017341	0.0075900	0.747	0.302	
4.	8.0	0.0	-9.8	0.036513	0.008471	-0.004429	0.000067	0.016331	0.002015	0.0021107	0.0084432	0.754	0.500	
5.	8.0	-2.0	-11.1	0.021244	0.009274	-0.002841	0.000223	0.015036	0.001971	0.0021108	0.0085221	0.754	0.500	
6.	10.0	-2.0	-12.9	0.024283	0.010106	-0.003354	-0.000076	0.016476	0.002428	0.0022908	0.0092434	0.754	0.500	
7.	6.0	-2.0	-9.1	0.018379	0.008314	-0.001913	-0.000098	0.013371	0.001754	0.0017656	0.0076867	0.756	0.500	
8.	6.0	-4.0	-9.8	0.008579	0.007889	-0.001079	-0.000341	0.013045	0.001566	0.0015891	0.0073510	0.756	0.500	
9.	8.0	-4.0	-11.9	0.005564	0.009192	-0.001291	-0.000468	0.013948	0.001678	0.0017658	0.0084123	0.757	0.500	
10.	10.0	-4.0	-13.8	0.011656	0.010074	-0.001868	-0.000245	0.015318	0.002254	0.0022955	0.0092801	0.757	0.500	
11.	10.0	-4.0	-8.0	-0.004747	0.008476	-0.000497	-0.000194	0.013878	0.001277	0.0012361	0.0063788	0.757	0.500	
12.	8.0	-2.0	-8.6	0.007581	0.006774	-0.001258	-0.000425	0.013880	0.001462	0.0015892	0.0065138	0.757	0.500	
13.	2.0	-2.0	-4.1	0.003976	0.005880	-0.000898	-0.000269	0.014519	0.001286	0.0014126	0.0057555	0.757	0.500	
14.	2.0	0.0	-3.3	0.014783	0.006337	-0.001688	0.000161	0.014386	0.001389	0.0014128	0.0062075	0.758	0.500	
15.	0.0	0.0	-1.1	0.006686	0.003992	-0.001049	-0.000159	0.014388	0.001091	0.0012360	0.0057684	0.757	0.500	
16.	0.0	2.0	-0.1	0.022879	0.005940	-0.002303	-0.000033	0.014860	0.001090	0.0008846	0.0059683	0.758	0.500	-1.0
17.	0.0	4.0	0.7	0.024806	0.006360	-0.003314	-0.000097	0.000546	0.000098	0.0003538	0.0064473	0.758	0.500	-1.3
18.	0.0	6.0	1.9	0.044607	0.003521	-0.004136	-0.000216	0.017446	-0.000487	-0.0003538	0.0057500	0.758	0.500	-1.4
19.	0.0	8.0	2.4	0.071077	0.003797	-0.005547	-0.000312	0.017723	-0.002283	-0.0017690	0.0083605	0.757	0.500	-1.4
20.	2.0	8.0	0.5	0.078469	0.001764	-0.006270	-0.000411	0.020643	-0.002209	-0.0015921	0.0077414	0.757	0.500	-1.4
21.	2.0	6.0	-0.6	0.060099	0.005691	-0.005508	0.000043	0.015205	-0.000728	-0.0005307	0.0083668	0.758	0.500	-1.0
22.	2.0	4.0	-1.8	0.044520	0.004692	-0.004394	-0.000046	0.017847	0.000468	0.0003538	0.0061730	0.758	0.500	-1.0
23.	4.0	4.0	-3.9	0.050074	0.007149	-0.005402	0.000375	0.013595	0.000819	0.0005307	0.0084834	0.758	0.500	- .8
24.	4.0	2.0	-4.8	0.034817	0.007714	-0.004611	0.000834	0.012571	0.001316	0.0012384	0.0079558	0.758	0.500	- .5
25.	4.0	0.0	-5.8	0.022084	0.007645	-0.003065	0.000553	0.012943	0.001602	0.0014153	0.0071924	0.758	0.500	- .4
26.	6.0	2.0	-7.0	0.041314	0.008298	-0.004883	0.000399	0.012802	0.001813	0.0012719	0.0086843	0.769	0.496	- .3
27.	2.0	2.0	-2.6	0.030236	0.007045	-0.003177	-0.000214	0.012784	0.001158	0.0008862	0.0069888	0.759	0.500	- .8
28.	4.0	6.0	-3.0	0.062057	0.006210	-0.006819	0.000561	0.012702	0.000078	0.0000000	0.0094442	0.759	0.500	- .9

Table II - 24. Rotor No. 3.

TEST 310.0 RUN 21

34 FT. 0012 ROTOR V/OR = .86 M(1.0)(90) = .47

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.1	0.009157	0.007066	-0.000928	-0.000609	0.019990	0.001227	0.0014035	0.0075418	0.869	0.462	-1.1
2.	0.0	2.0	-0.4	0.026547	0.007059	-0.002131	-0.001087	0.018328	0.000847	0.0011213	0.0078475	0.850	0.467	-1.4
3.	0.0	4.0	0.3	0.045011	0.007637	-0.003270	-0.000817	0.018133	0.000302	0.0004548	0.0095867	0.856	0.465	-1.5
4.	0.0	6.0	1.3	0.056705	0.007490	-0.004359	-0.000562	0.016965	-0.000910	-0.0006728	0.0104929	0.850	0.467	-1.4
5.	0.0	8.0	2.0	0.079161	0.004583	-0.006229	-0.000187	0.020188	-0.002404	-0.0017940	0.0111936	0.850	0.467	-1.8
6.	2.0	0.0	-1.0	0.060818	0.007118	-0.005632	-0.000658	0.018068	-0.000826	-0.0004548	0.0108952	0.855	0.465	-1.3
7.	2.0	4.0	-2.1	0.046016	0.009138	-0.004386	-0.000372	0.016314	0.000144	0.0004557	0.0109444	0.857	0.465	-1.1
8.	2.0	2.0	-2.9	0.027341	0.008457	-0.002906	-0.000665	0.018881	0.001071	0.0009113	0.0089407	0.857	0.465	-1.0
9.	2.0	0.0	-3.4	0.013687	0.007142	-0.001837	-0.000715	0.019224	0.001087	0.0013644	0.0074707	0.856	0.465	-1.0
10.	2.0	-2.0	-4.2	-0.002404	0.007132	-0.000710	-0.000927	0.018179	0.001190	0.0015919	0.0077696	0.857	0.466	- .8
11.	4.0	-2.0	-6.6	0.002290	0.008156	-0.002013	-0.000130	0.018512	0.001377	0.0015918	0.0085009	0.856	0.465	- .5
12.	4.0	-4.0	-7.5	-0.014106	0.007956	0.000086	-0.001002	0.017211	0.000795	0.0011371	0.0087550	0.857	0.466	- .4
13.	4.0	0.0	-6.0	0.015054	0.008678	-0.003038	-0.000112	0.017350	0.001504	0.0015919	0.0091897	0.857	0.466	- .7
14.	4.0	2.0	-5.1	0.030815	0.008291	-0.004190	-0.000343	0.019389	0.001128	0.0011371	0.0091239	0.857	0.466	- .7
15.	4.0	4.0	-4.3	0.045101	0.007290	-0.005873	0.000253	0.019743	0.000589	0.0006822	0.0095164	0.855	0.465	- .7
16.	4.0	6.0	-3.4	0.060928	0.006939	-0.007381	-0.000038	0.019467	-0.000020	0.0000000	0.0112382	0.857	0.466	-1.0
17.	4.0	8.0	-2.4	0.088609	0.004439	-0.008449	-0.000628	0.020044	-0.000826	-0.0006822	0.0133489	0.856	0.465	-1.1
18.	6.0	6.0	-5.0	0.075838	0.008894	-0.009339	0.000500	0.018632	0.000854	0.0009098	0.0150440	0.855	0.465	- .2
19.	6.0	4.0	-6.6	0.050323	0.010861	-0.006794	0.000072	0.015839	0.001347	0.0011370	0.0138230	0.856	0.465	- .6
20.	6.0	2.0	-7.5	0.037054	0.010887	-0.005773	0.000264	0.016996	0.001313	0.0011371	0.0115101	0.856	0.466	- .4
21.	6.0	0.0	-8.4	0.015861	0.010392	-0.003967	0.000220	0.017821	0.001262	0.0015919	0.0104820	0.857	0.466	- .3
22.	6.0	-2.0	-9.2	0.001615	0.011049	-0.002194	-0.000264	0.016006	0.001063	0.0015919	0.0110050	0.857	0.466	
23.	6.0	-4.0	-10.0	-0.012952	0.010534	-0.000839	-0.000693	0.016735	0.000555	0.0009097	0.0106852	0.857	0.466	
24.	6.0	-6.0	-10.8	-0.043437	0.008254	0.000081	-0.000051	0.003029	0.000732	0.0002274	0.0110705	0.856	0.465	
25.	8.0	-6.0	-12.7	-0.021441	0.011505	-0.000182	-0.000888	0.017438	-0.000308	0.0000000	0.0117022	0.856	0.466	
26.	8.0	-4.0	-12.0	-0.011686	0.011957	-0.000748	-0.000853	0.017636	0.000649	0.0009097	0.0118227	0.857	0.466	
27.	8.0	-2.0	-11.2	0.005416	0.012286	-0.002571	-0.000259	0.017488	0.001101	0.0013644	0.0117105	0.856	0.465	
28.	8.0	0.0	-10.3	0.017837	0.011751	-0.003784	-0.000809	0.018193	0.001089	0.0015919	0.0110404	0.856	0.465	
29.	8.0	2.0	-9.7	0.032439	0.011171	-0.005867	-0.000051	0.018325	0.001609	0.0015919	0.0120805	0.856	0.465	
30.	10.0	0.0	-12.1	0.032562	0.013828	-0.006097	0.000271	0.018403	0.001969	0.0020468	0.0138570	0.857	0.466	.4
31.	10.0	-2.0	-13.3	0.009845	0.014000	-0.003584	-0.000199	0.018052	0.001581	0.0015920	0.0132835	0.857	0.466	.1
32.	10.0	-4.0	-14.1	-0.004386	0.013955	-0.002418	-0.000021	0.017204	0.001273	0.0011371	0.0133263	0.857	0.466	.2
33.	10.0	-6.0	-15.0	-0.015165	0.013415	-0.001386	0.000237	0.018022	-0.000032	0.0004548	0.0132331	0.857	0.466	.2
34.	10.0	-8.0	-15.8	-0.026746	0.012890	-0.000103	-0.000775	0.017116	-0.001269	-0.0008971	0.0131075	0.851	0.467	.4

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
18	6	6	1.2	0
30	10	0	1.2	.6

Table II – 25. Rotor No. 3.

TEST 310.0 RUN 22

34 FT. 0012 ROTOR V/OR = .94 M(1.0)(90) = .49

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

RT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.4	0.016292	0.009670	-0.001045	0.004606	0.035292	0.001809	0.0015265	0.0106550	0.945	0.500	-1.4
2.	0.0	2.0	-0.6	0.032904	0.008900	-0.002956	0.004970	0.036825	0.001124	0.0010966	0.0105714	0.947	0.499	
3.	0.0	4.0	0.2	0.049068	0.007381	-0.003729	0.004346	0.039295	0.000581	0.0004394	0.0105729	0.947	0.499	-1.8
4.	0.0	6.0	1.1	0.066391	0.007161	-0.005639	0.005189	0.034809	-0.000694	-0.0006599	0.0123810	0.938	0.496	
5.	2.0	4.0	-2.5	0.047381	0.007557	-0.005357	0.005575	0.035258	0.000830	0.0006556	0.0107033	0.934	0.496	-1.5
6.	2.0	6.0	-1.4	0.062063	0.006452	-0.006331	0.005718	0.035285	0.000159	0.0000000	0.0119237	0.934	0.496	
7.	2.0	8.0	-0.7	0.092329	0.004668	-0.007170	0.005460	0.035502	-0.001853	-0.0015297	0.0144739	0.933	0.496	-1.8
8.	2.0	2.0	-3.0	0.031996	0.008941	-0.004002	0.005329	0.034674	0.001303	0.0010989	0.0104735	0.936	0.496	
9.	2.0	0.0	-3.9	0.011960	0.008421	-0.002032	0.004230	0.035764	0.001851	0.0015857	0.0095133	0.944	0.493	-1.2
10.	2.0	5.0	-1.9	0.052169	0.007059	-0.005627	0.005452	0.036380	0.000497	0.0004497	0.0112771	0.943	0.492	-1.4
11.	2.0	7.0	-1.2	0.077632	0.006886	-0.007694	0.006345	0.035118	-0.000185	-0.0006761	0.0146094	0.950	0.493	
12.	4.0	7.0	-3.4	0.077686	0.008312	-0.009071	0.006582	0.031610	0.000413	-0.0002257	0.0162916	0.944	0.491	-1.1
13.	4.0	8.0	-3.0	0.087919	0.004970	-0.007570	0.005664	0.037296	0.000166	-0.0004516	0.0155919	0.950	0.492	
14.	4.0	6.0	-4.0	0.066870	0.008763	-0.008583	0.006734	0.034049	0.000326	0.0000000	0.0146797	0.950	0.492	
15.	4.0	5.0	-4.5	0.051543	0.008281	-0.007456	0.005713	0.036362	0.000931	0.0004470	0.0123911	0.944	0.494	-1.1
16.	4.0	4.0	-5.0	0.047395	0.009758	-0.006599	0.005863	0.033738	0.001412	0.0006805	0.0128913	0.942	0.489	-1.1
17.	4.0	2.0	-5.8	0.028568	0.010543	-0.004876	0.005786	0.032874	0.001389	0.0011342	0.0119801	0.943	0.489	- .9
18.	4.0	0.0	-6.4	0.011584	0.010247	-0.003813	0.005781	0.032772	0.001215	0.0013637	0.0110375	0.944	0.489	- .6
19.	6.0	0.0	-8.6	0.008460	0.013235	-0.004009	0.005886	0.031466	0.000893	0.0011363	0.0136210	0.943	0.489	
20.	6.0	2.0	-7.9	0.031247	0.013461	-0.006390	0.006476	0.031249	0.001274	0.0009107	0.0146009	0.944	0.489	
21.	6.0	4.0	-7.0	0.040785	0.011478	-0.007371	0.006274	0.033900	0.001896	0.0009106	0.0143426	0.943	0.489	- .4
22.	6.0	5.0	-6.5	0.053580	0.010857	-0.008258	0.006122	0.033543	0.001621	0.0006830	0.0152159	0.945	0.489	
23.	6.0	6.0	-6.0	0.061880	0.010003	-0.008561	0.006228	0.033640	0.001649	0.0006830	0.0160568	0.944	0.489	
24.	8.0	2.0	-9.9	0.028113	0.015428	-0.006503	0.006418	0.032069	0.001579	0.0011425	0.0166249	0.946	0.488	.4
25.	8.0	1.0	-10.4	0.018097	0.015907	-0.005715	0.006559	0.031191	0.001449	0.0011425	0.0164700	0.946	0.488	.2
26.	8.0	0.0	-10.8	0.009641	0.016465	-0.004516	0.005866	0.030658	0.000839	0.0011445	0.0167131	0.946	0.488	

Table II – 26. Rotor No. 3.

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = 1.1 M(1.0)(90) = .52

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.011358	0.007943	-0.001043	-0.000773	0.032879	0.001505	0.0016873	0.0090945	0.983	0.489	-1.3
2.	0.0	0.0	-1.2	0.012140	0.009380	-0.001286	-0.000491	0.046411	0.001561	0.0016927	0.0110084	0.994	0.505	-1.4
3.	0.0	0.0	-1.2	0.014520	0.010062	-0.001343	-0.000403	0.057483	0.001564	0.0017077	0.0121070	1.034	0.514	-1.4
4.	0.0	0.0	-1.3	0.018777	0.011240	-0.001123	-0.001098	0.076990	0.001568	0.0017319	0.0140077	1.093	0.526	-1.5
5.	0.0	0.0	-1.4	0.018883	0.011155	-0.000991	-0.001193	0.076622	0.001378	0.0017483	0.0139616	1.096	0.524	-1.4
6.	0.0	2.0	-0.6	0.048320	0.011016	-0.003014	-0.000262	0.075720	0.001503	0.0013017	0.0151879	1.099	0.521	-1.8
7.	0.0	4.0	-0.2	0.070304	0.010871	-0.004502	-0.001580	0.079923	0.000403	0.0005861	0.0178105	1.103	0.525	-2.0
8.	0.0	6.0	0.5	0.088959	0.010536	-0.006727	-0.001667	0.077742	-0.001015	-0.0005963	0.0211573	1.111	0.522	-2.3
9.	0.0	8.0	0.8	0.091302	0.008946	-0.006787	-0.001025	0.074320	-0.001357	-0.0010755	0.0188888	1.096	0.517	-2.2
10.	2.0	6.0	-1.7	0.086065	0.009491	-0.007993	-0.000709	0.070420	-0.000696	-0.0005982	0.0192796	1.090	0.516	-1.6
11.	2.0	7.0	-1.4	0.101765	0.010242	-0.008670	-0.000547	0.069761	-0.001361	-0.0013166	0.0230994	1.095	0.517	-1.8
12.	2.0	5.0	-2.3	0.071422	0.011431	-0.007001	-0.000477	0.070148	0.000432	0.0001197	0.0192018	1.092	0.516	-1.5
13.	2.0	4.0	-2.6	0.060918	0.011334	-0.006349	0.000157	0.071808	0.000988	0.0006004	0.0175112	1.094	0.516	-1.4
14.	2.0	3.0	-3.1	0.047822	0.010406	-0.005277	0.000267	0.072380	0.001460	0.0008405	0.0148672	1.093	0.515	-1.2
15.	2.0	2.0	-3.5	0.036263	0.011412	-0.004838	-0.000128	0.070665	0.001801	0.0013254	0.0151535	1.094	0.515	-1.2
16.	2.0	1.0	-3.7	0.024475	0.012599	-0.003789	-0.000301	0.068807	0.001755	0.0015691	0.0158153	1.095	0.515	-1.1
17.	2.0	0.0	-4.1	0.019370	0.012627	-0.003006	-0.000077	0.068954	0.001739	0.0015688	0.0153719	1.094	0.514	-1.1
18.	2.0	-1.0	-4.3	0.004032	0.012388	-0.002103	-0.001267	0.069510	0.001678	0.0015689	0.0150419	1.094	0.514	
19.	1.0	0.0	-3.0	0.013696	0.011292	-0.002549	-0.000720	0.068814	0.001671	0.0018131	0.0141458	1.093	0.514	-1.2
20.	1.0	2.0	-2.0	0.043182	0.011357	-0.004154	-0.000039	0.070348	0.001671	0.0013294	0.0153056	1.091	0.513	-1.4
21.	1.0	4.0	-1.4	0.069977	0.010397	-0.005233	-0.000623	0.071078	0.000715	0.0006043	0.0171052	1.091	0.513	-1.6
22.	1.0	6.0	-0.8	0.089829	0.009330	-0.007899	-0.000523	0.070838	-0.000911	-0.0008489	0.0193109	1.092	0.513	-1.8
23.	3.0	6.0	-3.2	0.077612	0.010612	-0.008400	-0.000698	0.069008	-0.000291	-0.0001213	0.0200896	1.092	0.512	-1.3
24.	3.0	7.0	-2.7	0.087550	0.008976	-0.008884	-0.000860	0.069324	-0.000481	-0.0006074	0.0205761	1.093	0.512	-1.5
25.	4.0	7.0	-3.5	0.096419	0.011468	-0.009389	-0.000419	0.067476	-0.000522	-0.0003651	0.0244342	1.095	0.512	- .6
26.	4.0	6.0	-4.3	0.071418	0.011365	-0.008729	-0.000732	0.069936	0.000265	-0.0001219	0.0202955	1.096	0.512	- .7
27.	4.0	4.0	-5.1	0.051348	0.013428	-0.007666	0.000235	0.069084	0.000809	0.0006095	0.0191405	1.098	0.512	-1.0
28.	4.0	2.0	-6.0	0.034317	0.013638	-0.005848	-0.001535	0.069284	0.000690	0.0008546	0.0170388	1.094	0.511	- .7
29.	4.0	0.0	-6.7	0.009104	0.015327	-0.004345	-0.000060	0.067295	0.000912	0.0010988	0.0178618	1.094	0.511	- .6
30.	5.0	0.0	-7.9	0.000770	0.016904	-0.005155	-0.000346	0.067701	0.000566	0.0008545	0.0193303	1.093	0.511	- .5
31.	6.0	0.0	-8.9	0.001113	0.018485	-0.005240	-0.000418	0.068165	0.000315	0.0003663	0.0205879	1.094	0.511	- .2
32.	6.0	2.0	-8.3	0.021137	0.017074	-0.007167	-0.000428	0.066896	0.000732	0.0003669	0.0198306	1.094	0.511	- .5
33.	6.0	1.0	-8.8	0.008243	0.017374	-0.005828	0.000089	0.067005	0.000849	0.0003674	0.0195144	1.093	0.510	
34.	7.0	0.0	-10.1	-0.000393	0.019516	-0.005506	-0.000029	0.066122	0.000422	-0.0001225	0.0212060	1.093	0.510	
35.	8.0	0.0	-5.8	0.006914	0.013469	-0.003994	0.000207	0.066448	0.001608	0.0013497	0.0160974	1.095	0.510	

For the following data point
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
25	4	7	0	.7